EXHIBIT 1

IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
WACO DIVISION

EPISTAR CORPORATION, Plaintiff, v. LOWE'S COMPANIES, INC., LOWE'S HOME CENTERS, LLC, Defendants.	CASE NO.: 6:20-cv-00420-ADA **JURY TRIAL DEMANDED**

PLAINTIFF EPISTAR CORPORATION'S
PRELIMINARY INFRINGEMENT CONTENTIONS

Plaintiff Epistar Corporation ("Plaintiff" or "Epistar") serves its Preliminary Infringement Contentions on Defendants Lowe's Companies, Inc. and Lowe's Home Centers, LLC (collectively, "Defendants" or "Lowe's") regarding U.S. Patent Nos. 7,489,068 ("the '068 Patent"), 8,240,881 ("the '881 Patent"), 9,065,022 ("the '022 Patent"), 9,664,340 ("the '340 Patent"), and 10,224,455 ("the '455 Patent") (collectively, "the Asserted Patents").

Discovery has yet to begin, and claim construction has not taken place. As a result, Epistar reserves the right to amend its contentions pursuant to Order No. 20 fn. 4 after claim construction has taken place and/or discovery has progressed.

I. IDENTIFICATION OF ASSERTED CLAIMS

Lowe's infringes at least claims 1, and 4-6 of the '068 Patent. For each asserted claim, at least 35 U.S.C. §§ 271(a), (b), (c), and (f) are applicable.

Lowe's infringes at least claims 1, 3, 9, and 17 of the '881 Patent. For each asserted claim, at least 35 U.S.C. §§ 271(a), (b), (c), and (f) are applicable.

Lowe's infringes at least claims 1, 2, 6, 8, 9, 12, 17, 19, 22, and 23 of the '022 Patent. For each asserted claim, at least 35 U.S.C. §§ 271(a), (b), (c), and (f) are applicable.

Lowe's infringes at least claims 1-11, 13-16, 19, and 20 of the '340 Patent. For each asserted claim, at least 35 U.S.C. §§ 271(a), (b), (c), and (f) are applicable.

Lowe's infringes at least claims 1, 3, 5, 6, 9, 10, 12, and 13 of the '455 Patent. For each asserted claim, at least 35 U.S.C. §§ 271(a), (b), (c), and (f) are applicable.

II. IDENTIFICATION OF ACCUSED PRODUCTS

Discovery and claim construction have yet to occur. Epistar reserves the right to amend the following lists of accused products as discovery progresses.

Epistar contends that at least Lowe's GE Classic Series lightbulbs, GE Refresh Series lightbulbs, GE Relax Series lightbulbs, GE Basic Series lightbulbs, GE Reveal Series lightbulbs, and GE Vintage Series lightbulbs that include one or more LED filaments infringe the asserted claims of the '068 Patent.

Epistar contends that at least Lowe's GE Classic Series lightbulbs, GE Refresh Series lightbulbs, GE Relax Series lightbulbs, GE Basic Series lightbulbs, GE Reveal Series lightbulbs, and GE Vintage Series lightbulbs that include one or more LED filaments infringe the asserted claims of the '881 Patent.

Epistar contends that at least Lowe's GE Classic Series lightbulbs, GE Refresh Series lightbulbs, GE Relax Series lightbulbs, GE Basic Series lightbulbs, GE Reveal Series lightbulbs, and GE Vintage Series lightbulbs that include one or more LED filaments infringe the asserted claims of the '022 Patent.

Epistar contends that at least Lowe's GE Classic Series lightbulbs, GE Refresh Series lightbulbs, GE Relax Series lightbulbs, GE Basic Series lightbulbs, GE Reveal Series lightbulbs,

and GE Vintage Series lightbulbs that include one or more LED filaments infringe the asserted claims of the '340 Patent.

Epistar contends that at least Lowe's GE Classic Series lightbulbs, GE Refresh Series lightbulbs, GE Relax Series lightbulbs, GE Basic Series lightbulbs, GE Reveal Series lightbulbs, and GE Vintage Series lightbulbs that include one or more LED filaments infringe the asserted claims of the '455 Patent.

III. CHART IDENTIFYING CLAIM ELEMENTS WITHIN ACCUSED PRODUCTS

Attached as Exhibits 1-5 are representative claim charts identifying where each element of each asserted claim of the Asserted Patents is found within the accused products. Epistar does not currently contend that any claim elements are governed by 35 U.S.C. § 112(6) (pre-AIA) or 35 U.S.C. § 112(f) (post-AIA).

The claim charts appended hereto as Exhibits 1-5 are exemplary, not limiting, and address the asserted claims without the benefit of full discovery. Any citations included in the claim charts are exemplary only and should not be construed as limiting.

In the claim charts appended hereto as Exhibits 1-5, Epistar has subdivided certain asserted claims to better explain where each claim element may be found within the accused products, and other products and/or services. The subdivisions in the claim chart should not be taken as an indication of the boundaries of claim elements with respect to the doctrine of equivalents or any other issue. Additionally, the accused products may infringe the asserted claims in multiple ways. Epistar reserves the right to provide an alternative claim mapping or infringement contention.

IV. INDIRECT INFRINGEMENT

Lowe's has induced, and is continuing to actively and knowingly induce, with specific intent, direct infringement of the Asserted Patents under 35 U.S.C. § 271(b) by making, using, offering for sale, selling, and/or importing the accused products. Lowe's had actual knowledge of the '881 and '022 Patents and/or their respective applications at least as of April 7, 2016. Lowe's had actual knowledge of the '068, '340, and '455 Patents and/or their respective applications at least as of May 22, 2020. As a result, Lowe's knew or should have known that that its actions would result in infringement of the Asserted Patents. Lowe's intentionally directs and encourages Lowe's customers, resellers, retailers, and end users to make, use, sell, and/or offer to sell within the United States and/or to import into the United States one or more devices that embody the patented invention and that incorporate the accused products and systems identified above. Lowe's provides support to instruct its customers on how to use the infringing technology.

Lowe's has also contributed to and continues to contribute to direct infringement of the Asserted Patents with knowledge of the Asserted Patents and its claims and that its actions would result in infringement by manufacturers, distributors, resellers, and end users. Lowe's provided and continues to provide the accused products knowing that such products constitute a material part of the Asserted Patents, knowing those accused products to be especially made or adapted to infringe the Asserted Patents, and knowing that the accused products are not staple articles or commodities of commerce suitable for substantial non-infringing use.

V. LITERAL INFRINGEMENT AND INFRINGEMENT UNDER THE DOCTRINE OF EQUIVALENTS

Epistar contends that each asserted claim is literally infringed by Lowe's accused products, as indicated by the infringement claim charts attached hereto as Exhibits 1-5. In the

alternative, Epistar contends that any asserted claim not found to be literally infringed is infringed under the doctrine of equivalents.

VI. IDENTIFICATION OF PRIORITY DATES

The asserted claims of the '068 Patent are entitled to a priority date of at least as early as December 13, 2004.

The asserted claims of the '881 Patent are entitled to a priority date of at least as early as September 12, 2006.

The asserted claims of the '022 Patent are entitled to a priority date of at least as early as May 29, 2012.

The asserted claims of the '340 Patent are entitled to a priority date of at least as early as June 11, 2013.

The asserted claims of the '455 Patent are entitled to a priority date of at least as early as January 27, 2006.

Epistar's investigation relating to the conception and reduction to practice of the patented inventions is ongoing and it therefore reserves the right to supplement and/or modify this date as discovery in this case continues.

VII. DOCUMENT PRODUCTION

Copies of the file history for each Asserted Patent: EPISTAR-LCI_0000001-EPISTAR-LCI_0001588.

Documents evidencing conception and reduction to practice for each claimed invention: EPISTAR-LCI_0001594-EPISTAR-LCI_0001614.

Dated: August 21, 2020

/s/ James C. Yoon

James C. Yoon (CA State Bar No. 177155)
jyoon@wsgr.com
Ryan R. Smith (CA State Bar No. 229323)
rsmith@wsgr.com
Albert Shih (CA State Bar No. 251726)
ashih@wsgr.com
WILSON SONSINI GOODRICH & ROSATI, P.C.
650 Page Mill Road
Palo Alto, CA 94304-1050
Telephone: (650) 493-9300
Fax: (650) 493-6811

Lucy Yen (NY State Bar No. 4871653)
lyen@wsgr.com
WILSON SONSINI GOODRICH & ROSATI, P.C.
1301 Avenue of the Americas, 40th Floor
New York, NY 10019-6022
Telephone: (212) 999-5800
Fax: (212) 999-5899

Celine Liu (CA State Bar No. 268990)
celine.liu@wsgr.com
WILSON SONSINI GOODRICH & ROSATI, P.C.
1700 K Street NW, Fifth Floor
Washington, DC 20006
Telephone: (202) 791-8800
Fax: (202) 973-8899

Attorneys for Plaintiff Epistar Corporation

CERTIFICATE OF SERVICE

The undersigned hereby certifies that a true and correct copy of the foregoing document has been served on August 21, 2020, via email on all counsel of record.

By: */s/ Jonathan Rich*
Jonathan Rich

EXHIBIT 1

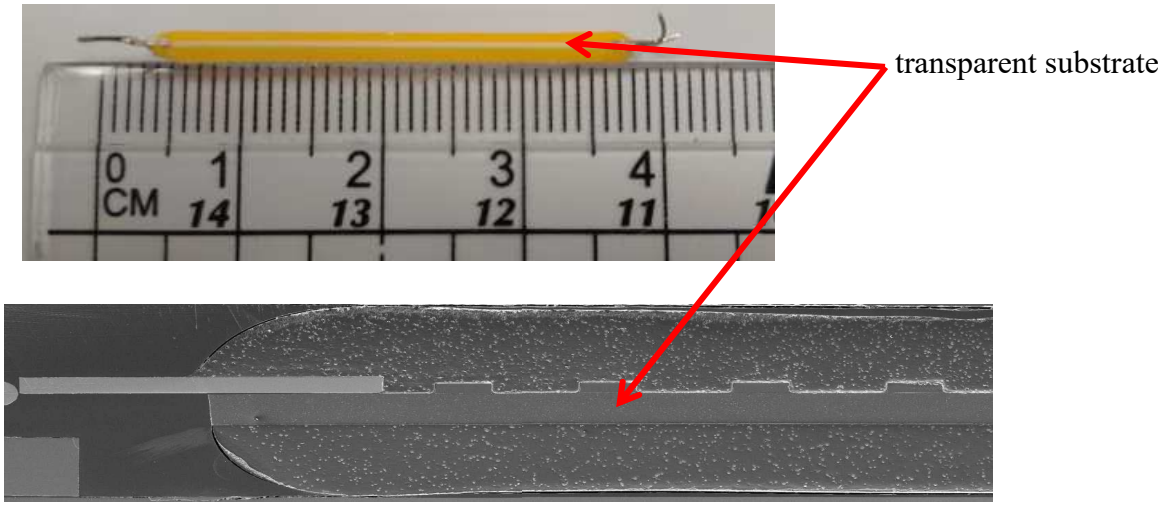
Exhibit 1: Infringement Claim Chart for U.S. Patent No. 7,489,068

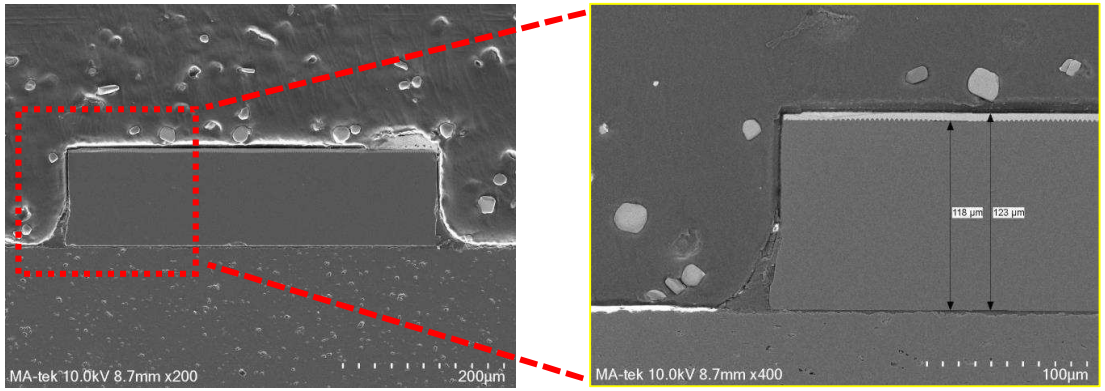
The Defendants infringe U.S. Patent No. 7,489,068 ("the '068 Patent") by making, using, selling, offering for sale, and importing at least certain GE Classic Series lightbulbs, GE Refresh Series lightbulbs, GE Relax Series lightbulbs, GE Basic Series lightbulbs, GE Reveal Series lightbulbs, and GE Vintage Series lightbulbs that include one or more LED filaments (the "Accused Product").

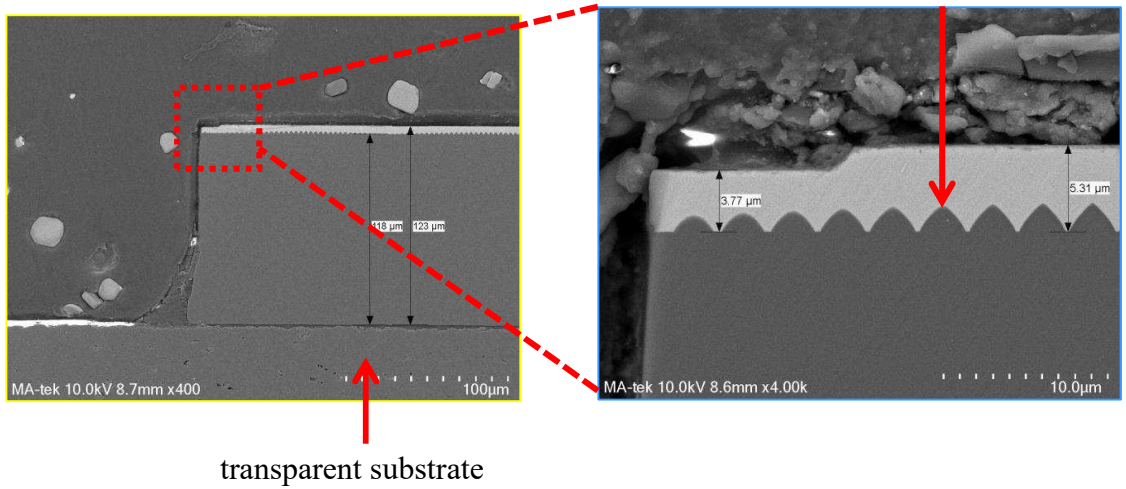
The asserted claims include elements that are implemented, at least in part, by proprietary hardware in the Accused Product. Plaintiff has provided these contentions based on analyzing the GE A19 Medium Base LED Filament Bulb as well as a review of the publicly available materials regarding the Accused Product. The chart is merely exemplary and may not show the functionality in its entirety. Furthermore, Plaintiff reserves the right to revise these contentions as discovery in the case progresses, in view of the Court's final claim construction in this action and in connection with expert reports.

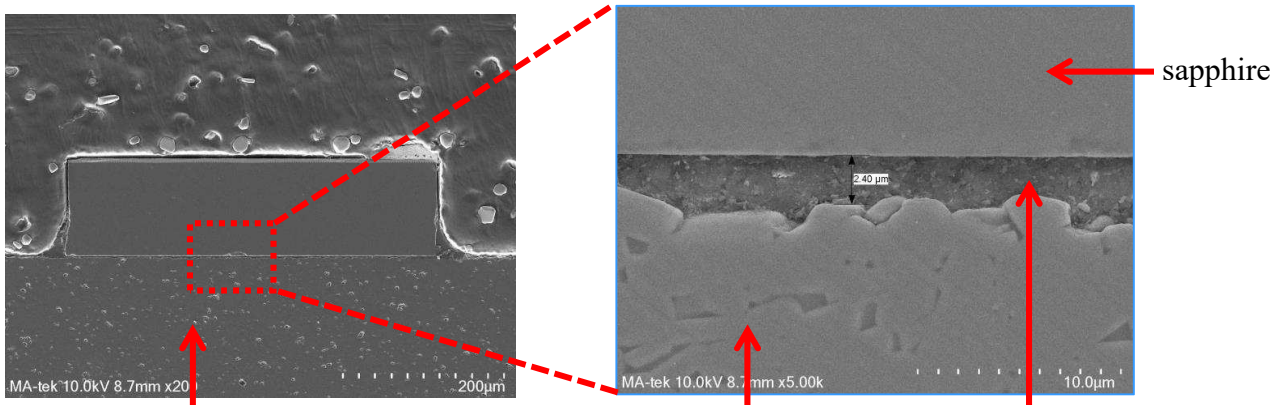
As one non-limiting example, at least the GE A19 Medium Base LED Filament Bulb includes the features cited in the chart below:

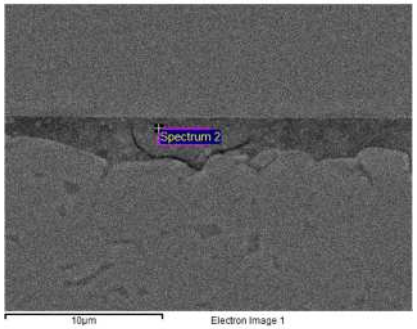
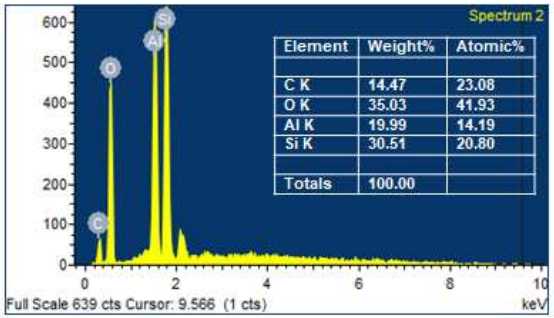
Claims	Exemplary Disclosures of Technical Features for GE A19 Medium Base LED Filament Bulb
1. A light emitting device, comprising:	The GE A19 Medium Base LED Filament Bulb includes a light emitting device. For example, as shown in the images below, the GE A19 Medium Base LED Filament Bulb includes a plurality of LED filaments.  

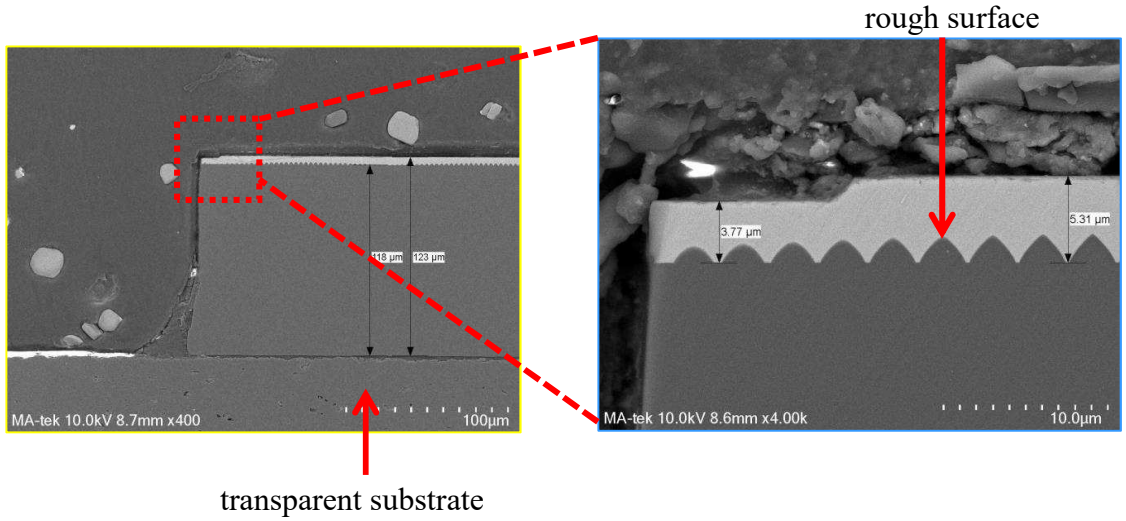
a transparent substrate;	The GE A19 Medium Base LED Filament Bulb includes a transparent substrate. For example, as shown in the photograph and microscopic image below, the GE A19 Medium Base LED Filament Bulb includes at least one filament that includes a transparent substrate. 

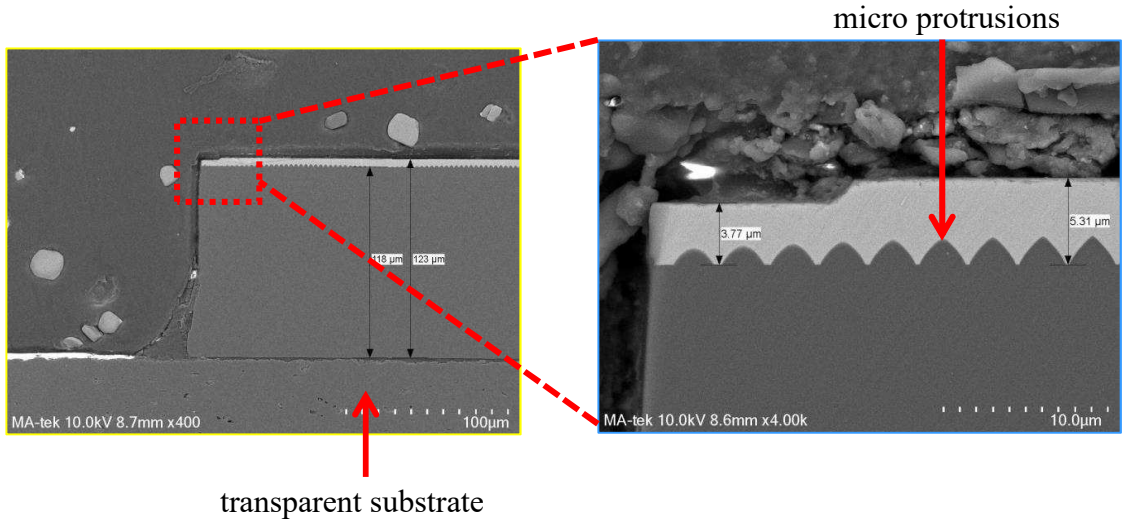
a light emitting stack having a first diffusing surface above the transparent substrate; and	The GE A19 Medium Base LED Filament Bulb includes a light emitting stack having a first diffusing surface above the transparent substrate. For example, as shown in the microscopic images below, the light-emitting stack of the GE A19 Medium Base LED Filament Bulb includes a diffusing surface with a plurality of protrusions above the transparent substrate.  first diffusing surface


MA-tek 10.0kV 8.7mm x400
100µm
MA-tek 10.0kV 8.6mm x4.00k
10.0µm
3.77 µm
5.31 µm
transparent substrate

a transparent adhesive layer between the transparent substrate and the first diffusing surface, wherein an index of refraction of the light emitting stack is different from that of the transparent adhesive layer.	The GE A19 Medium Base LED Filament Bulb includes a transparent adhesive layer between the transparent substrate and the first diffusing surface, wherein an index of refraction of the light emitting stack is different from that of the transparent adhesive layer. For example, as shown in the microscopic image below, between the transparent substrate and the first diffusing layer is a transparent adhesive layer.  Based on a material analysis, the material for the transparent adhesive layer is silicone-based, and the material for the portion of the light-emitting stack immediately next to the transparent adhesive is sapphire. These two different materials have different indices of refraction.

	 Spectrum 2 10µm Electron Image 1  Spectrum 2 Element Weight% Atomic% C K 14.47 23.08 O K 35.03 41.93 Al K 19.99 14.19 Si K 30.51 20.80 Totals 100.00 600 500 400 300 200 100 0 0 2 4 6 8 10 Full Scale 639 cts Cursor: 9.566 (1 cts) keV

4. The light emitting device according to claim 1, wherein the first diffusing surface comprises a rough surface.	The GE A19 Medium Base LED Filament Bulb includes a light emitting stack having a first diffusing surface above the transparent substrate, wherein the first diffusing surface comprises a rough surface. For example, as shown in the microscopic images below, the light-emitting stack of the GE A19 Medium Base LED Filament Bulb includes a diffusing surface above the transparent substrate, wherein the diffusing surface has a plurality of protrusions. 

5. The light emitting device according to claim 4, wherein the rough surface comprises a plurality of micro protrusions.	The GE A19 Medium Base LED Filament Bulb includes a light emitting stack having a first diffusing surface above the transparent substrate, wherein the first diffusing surface comprises a rough surface. For example, as shown in the microscopic images below, the light-emitting stack of the GE A19 Medium Base LED Filament Bulb includes a diffusing surface above the transparent substrate, wherein the diffusing surface has a plurality of micro protrusions. 

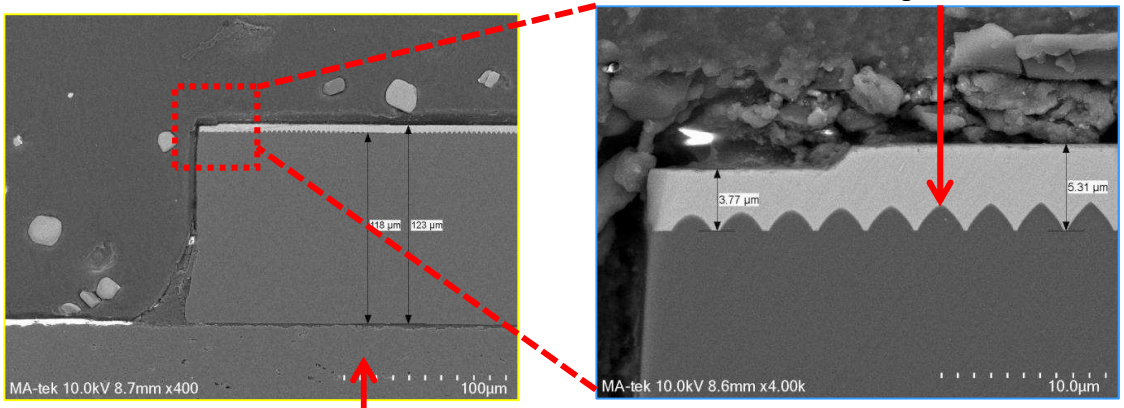
6. The light-emitting device according to claim 5, wherein the micro protrusions have a shape selected from the group consisting of semi-sphere, pyramid, pyramid polygon, and combinations thereof.	The GE A19 Medium Base LED Filament Bulb includes a light emitting stack having a first diffusing surface above the transparent substrate, wherein the first diffusing surface comprises a rough surface. For example, as shown in the microscopic images below, the light-emitting stack of the GE A19 Medium Base LED Filament Bulb includes a diffusing surface above the transparent substrate, wherein the diffusing surface has a plurality of micro protrusions that resemble pyramid, pyramid polygon, and combinations thereof. micro protrusions  transparent substrate

EXHIBIT 2

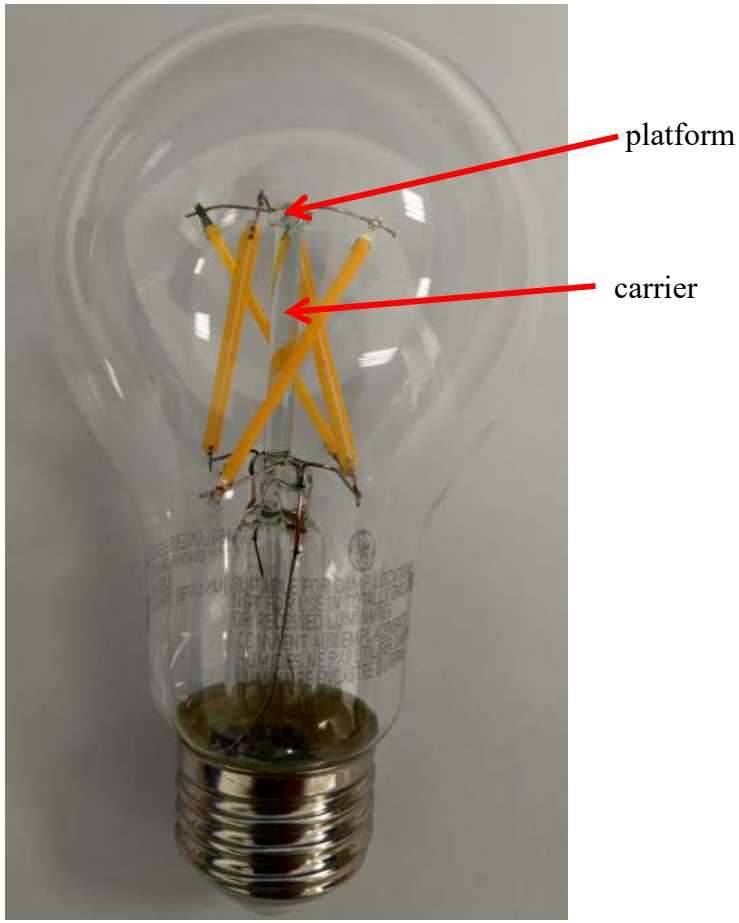
Exhibit 2: Infringement Claim Chart for U.S. Patent No. 8,240,881

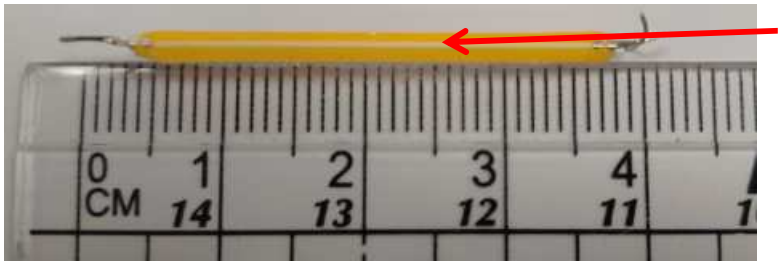
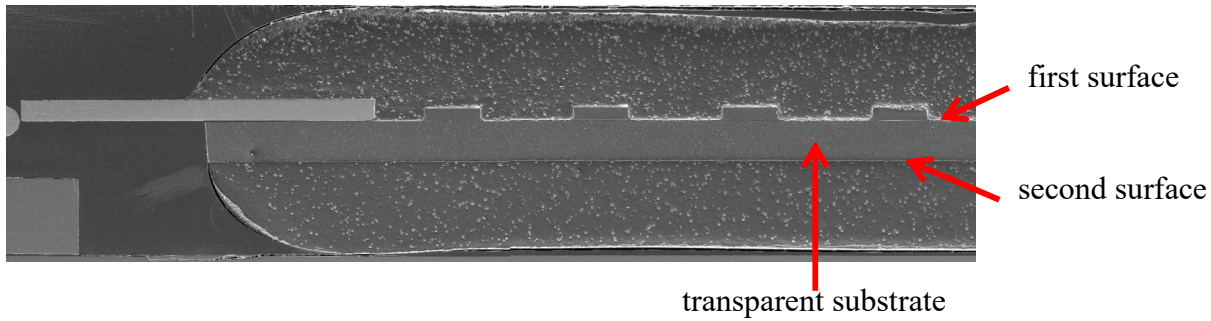
The Defendants infringe U.S. Patent No. 8,240,881 ("the '881 Patent") by making, using, selling, offering for sale, and importing at least certain GE Classic Series lightbulbs, GE Refresh Series lightbulbs, GE Relax Series lightbulbs, GE Basic Series lightbulbs, GE Reveal Series lightbulbs, and GE Vintage Series lightbulbs that include one or more LED filaments (the "Accused Product").

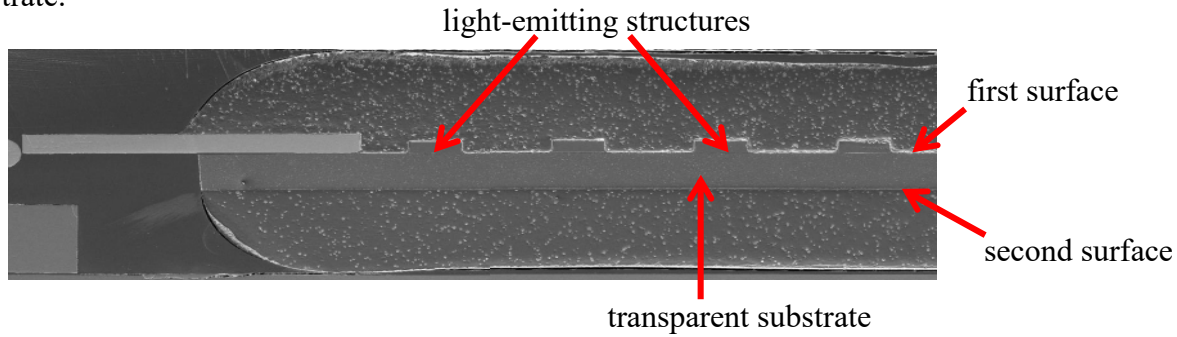
The asserted claims include elements that are implemented, at least in part, by proprietary hardware in the Accused Product. Plaintiff has provided these contentions based on analyzing the GE A19 Medium Base LED Filament Bulb as well as a review of the publicly available materials regarding the Accused Product. The chart is merely exemplary and may not show the functionality in its entirety. Furthermore, Plaintiff reserves the right to revise these contentions as discovery in the case progresses, in view of the Court's final claim construction in this action and in connection with expert reports.

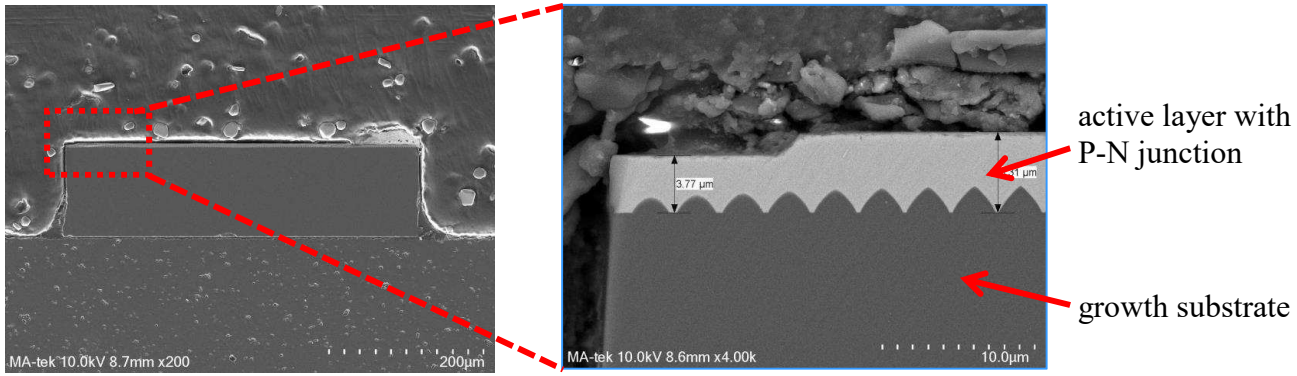
As one non-limiting example, at least the GE A19 Medium Base LED Filament Bulb includes the features cited in the chart below:

Claims	Exemplary Disclosures of Technical Features for GE A19 Medium Base LED Filament Bulb
1. A light-emitting device package comprising:	The GE A19 Medium Base LED Filament Bulb includes a light-emitting device package. For example, as shown in the image below, the GE A19 Medium Base LED Filament Bulb includes a light-emitting device package.  

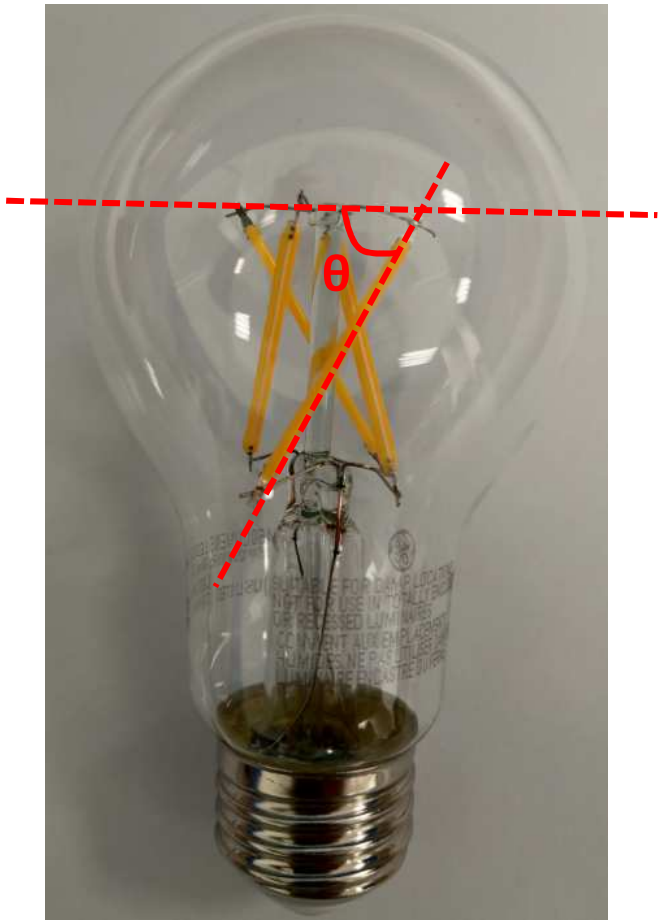
a carrier having a platform; and	The GE A19 Medium Base LED Filament Bulb includes a carrier having a platform. For example, as shown in the image below, the GE A19 Medium Base LED Filament Bulb includes a column carrier attached to a platform. The platform is attached to four LED filaments. 

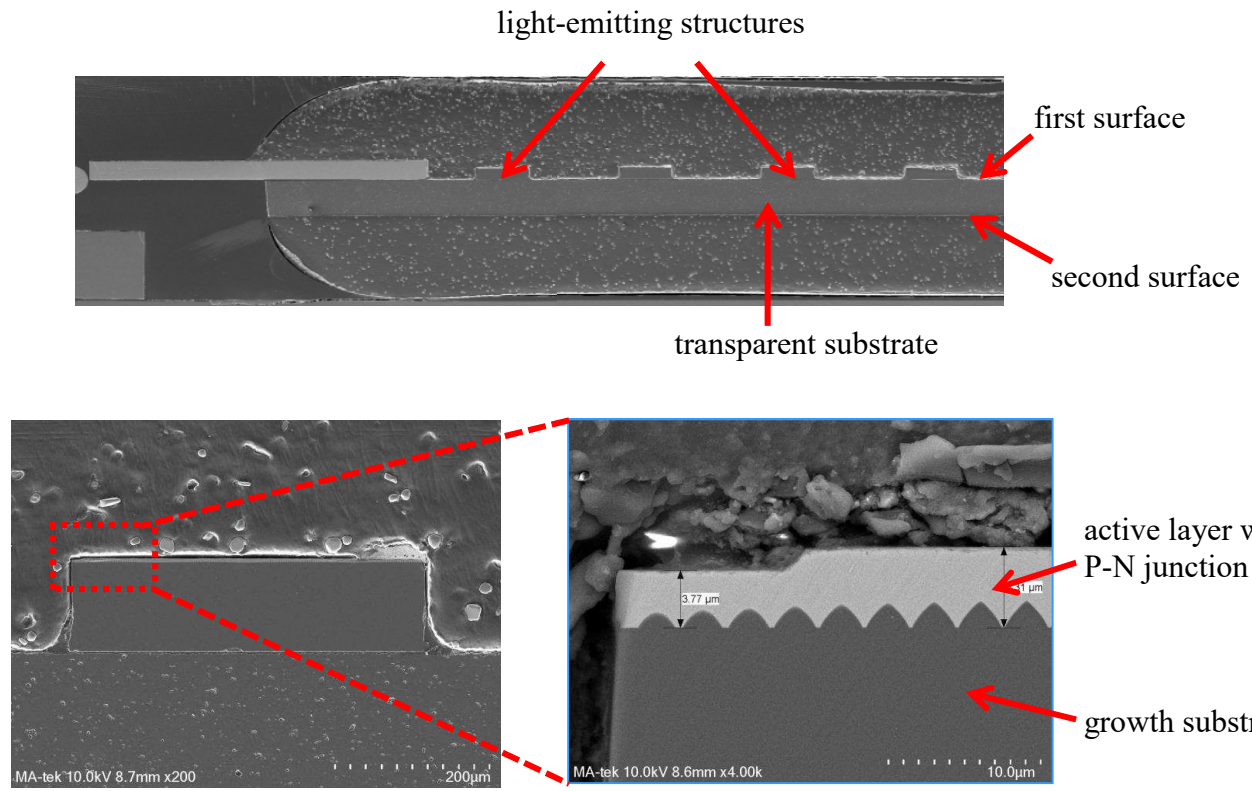
a light-emitting device comprising: a transparent substrate having a first surface and a second surface; and	The light-emitting device package of the GE A19 Medium Base LED Filament Bulb includes a light-emitting device comprising a transparent substrate having a first surface and a second surface. For example, as shown in the image below, a filament of the GE A19 Medium Base LED Filament Bulb includes a transparent substrate.  As shown further in a microscopic image of the transparent substrate below, each transparent substrate has a first surface. The second surface is on the opposite side the first surface. 

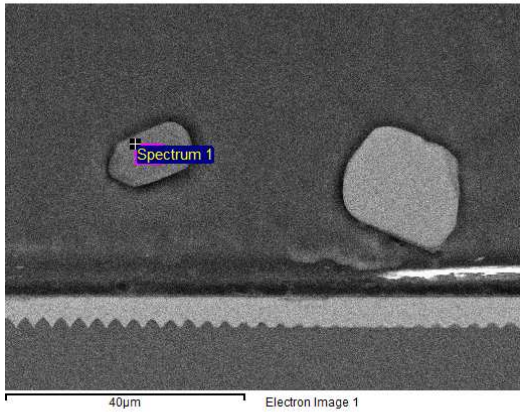
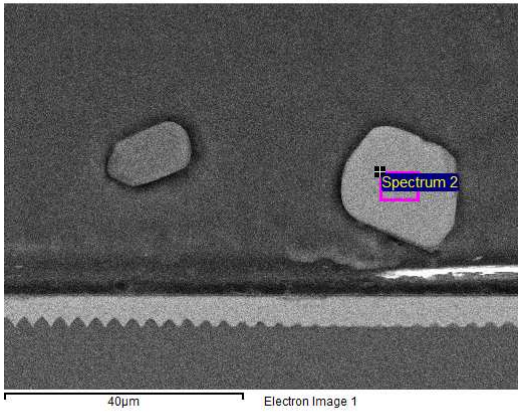
a light-emitting structure formed on the first surface of the transparent substrate,	The light-emitting device package of the GE A19 Medium Base LED Filament Bulb includes a light-emitting structure formed on the first surface of the transparent substrate. For example, as shown in a microscopic image of the transparent substrate below, the transparent substrate has a plurality of light-emitting structures formed on the first surface of the transparent substrate. 

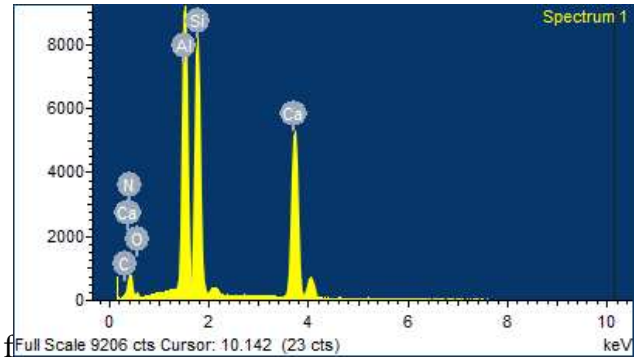
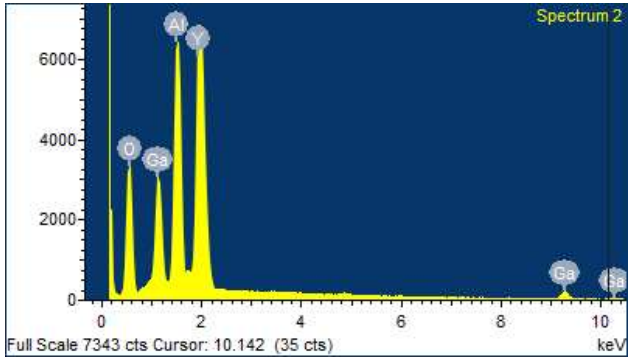
wherein the light-emitting structure comprises at least a growth substrate and an active layer with p-n junction formed on the growth substrate, and	The light-emitting structure of the GE A19 Medium Base LED Filament Bulb includes a growth substrate and an active layer with p-n junction formed on the growth substrate. For example, as shown in the microscopic images of the transparent substrate below, each light-emitting structure includes a growth substrate and an active layer with p-n junction formed on the growth substrate. 

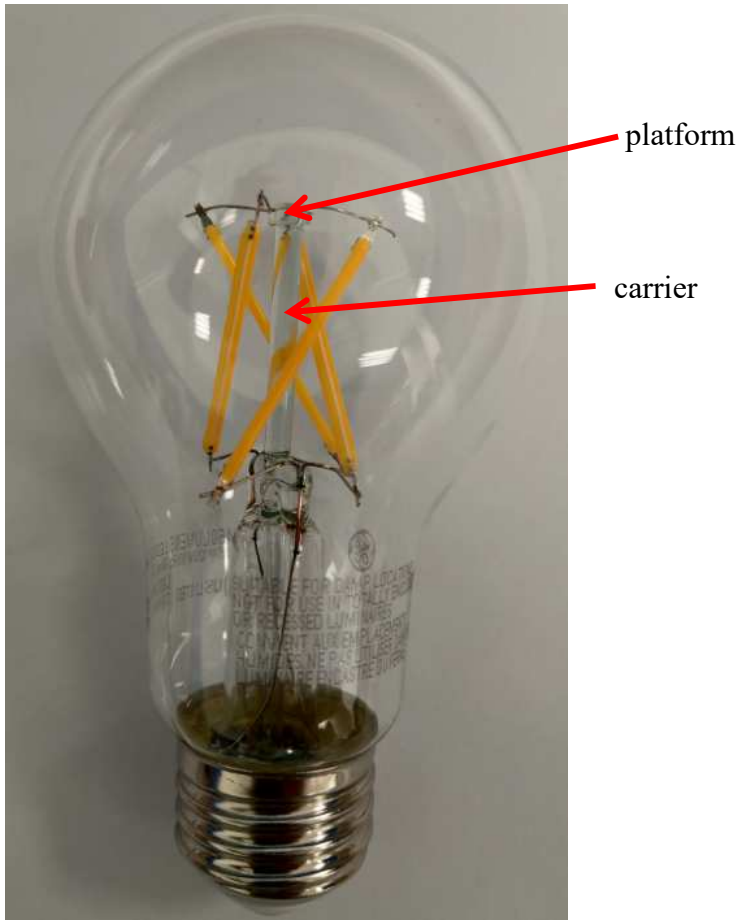
an angle between the first surface of the transparent substrate and the platform is 45-135 degrees.	The light-emitting device package of the GE A19 Medium Base LED Filament Bulb has an angle between the first surface of the transparent substrate and the platform that is between 45 and 135 degrees. For example, as show in the image below, the filament is attached to the glass column via the platform at an angle between 45 and 135 degrees.

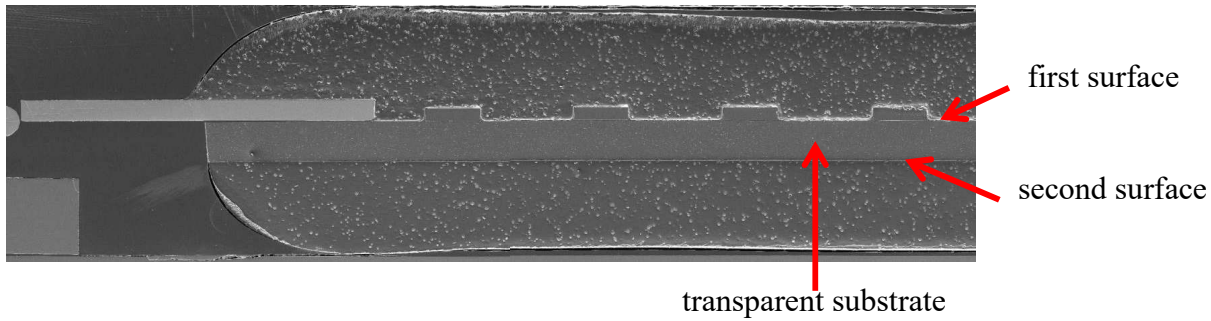
	 θ

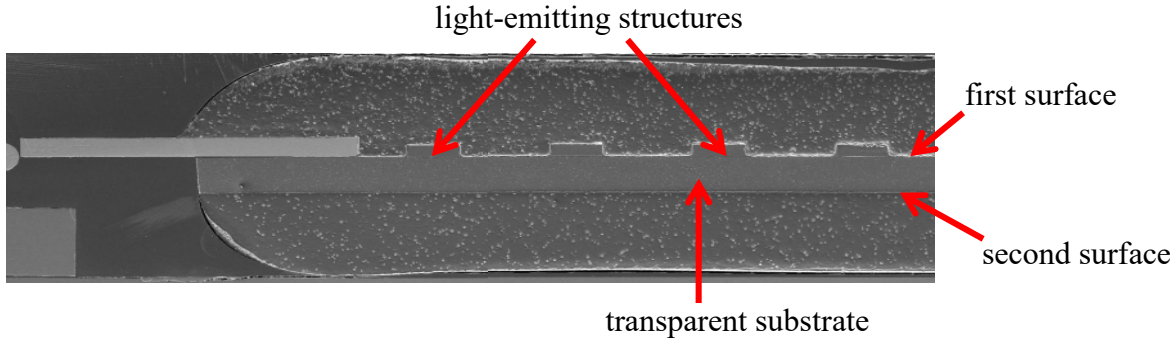
3. The light-emitting device package according to claim 1, wherein the area of the first surface and/or the second surface is not smaller than the area of the p-n junction.	The light-emitting device package of the GE A19 Medium Base LED Filament Bulb includes a first surface, a second surface, and a p-n junction, wherein the area of the first surface and/or the second surface is not smaller than the area of the p-n junction. For example, as shown in microscopic images below, both the area of the first surface and the area of the second surface appear larger than the area of the p-n junction. 

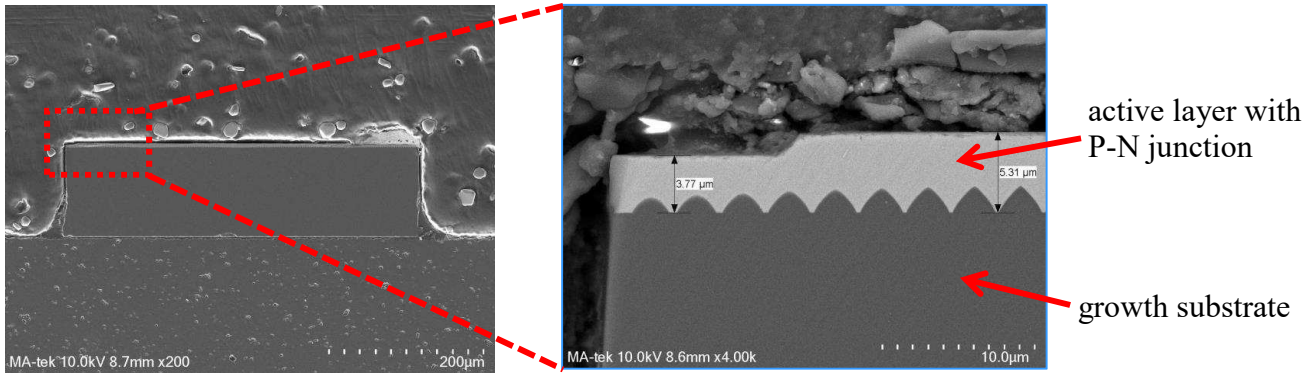
9. The light-emitting device package according to claim 1, further comprising a phosphor layer coated around the light-emitting device.	The light-emitting device package of the GE A19 Medium Base LED Filament Bulb includes a phosphor layer coated around the light-emitting device. For example, as shown in the photo and the microscopic images below, a filament of the GE A19 Medium Base LED Filament Bulb includes a phosphor layer that appears in color coated around the LED filament.  phosphor layer  

	 
17. A light-emitting device package comprising:	The GE A19 Medium Base LED Filament Bulb includes a light-emitting device package. For example, as shown in the image below, the GE A19 Medium Base LED Filament Bulb includes a light-emitting device package.  

a carrier having a platform;	The GE A19 Medium Base LED Filament Bulb includes a carrier having a platform. For example, as shown in the image below, the GE A19 Medium Base LED Filament Bulb includes a column carrier attached to a platform. The platform is attached to four LED filaments. 

and a light-emitting device comprising: a transparent substrate having a first surface and a second surface; and	The light-emitting device package of the GE A19 Medium Base LED Filament Bulb includes a light-emitting device comprising a transparent substrate having a first surface and a second surface. For example, as shown in the image below, a filament of the GE A19 Medium Base LED Filament Bulb includes a transparent substrate.  As shown further in a microscopic image of the transparent substrate below, each transparent substrate has a first surface. The second surface is on the opposite side the first surface. 

a light-emitting structure formed on the first surface of the transparent substrate, wherein	The light-emitting device package of the GE A19 Medium Base LED Filament Bulb includes a light-emitting structure formed on the first surface of the transparent substrate. For example, as shown in a microscopic image of the transparent substrate below, the transparent substrate has a plurality of light-emitting structures formed on the first surface of the transparent substrate. 

the light-emitting structure has at least a growth substrate and an active layer with p-n junction formed on the growth substrate, and an angle between the p-n junction and the platform is not equal to zero degree.	The light-emitting structure of the GE A19 Medium Base LED Filament Bulb includes a growth substrate and an active layer with p-n junction formed on the growth substrate. For example, as shown in the microscopic images of the transparent substrate below, each light-emitting structure includes a growth substrate and an active layer with p-n junction formed on the growth substrate.  As shown in the image below, the light-emitting structure including the p-n junction forms an angle more than zero degree with the platform of the GE A19 Medium Base LED Filament Bulb.

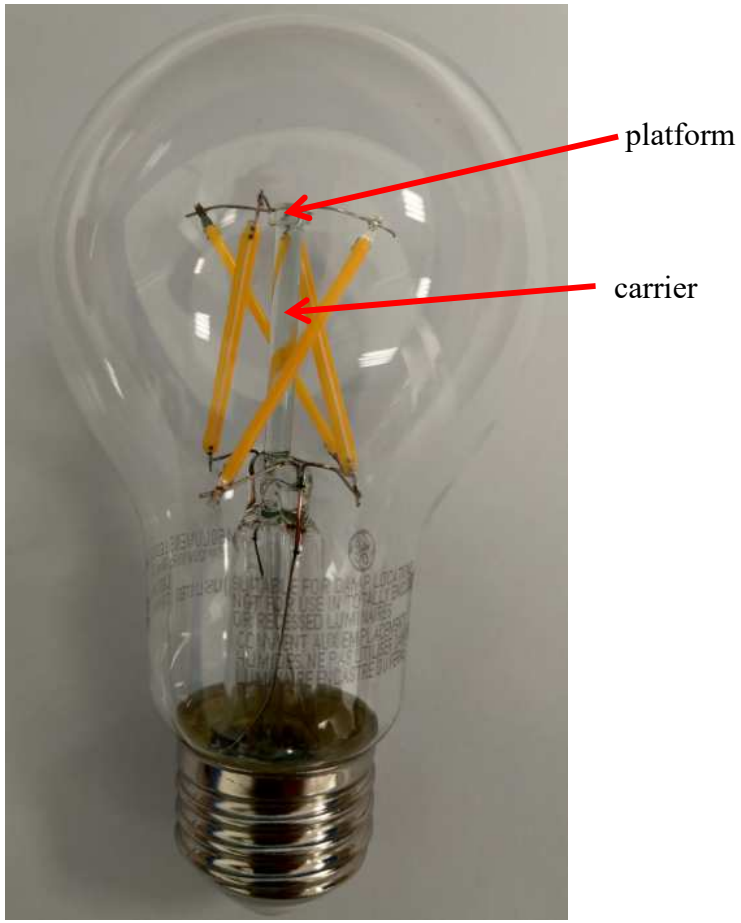

platform
carrier

EXHIBIT 3

Exhibit 3: Infringement Claim Chart for U.S. Patent No. 9,065,022

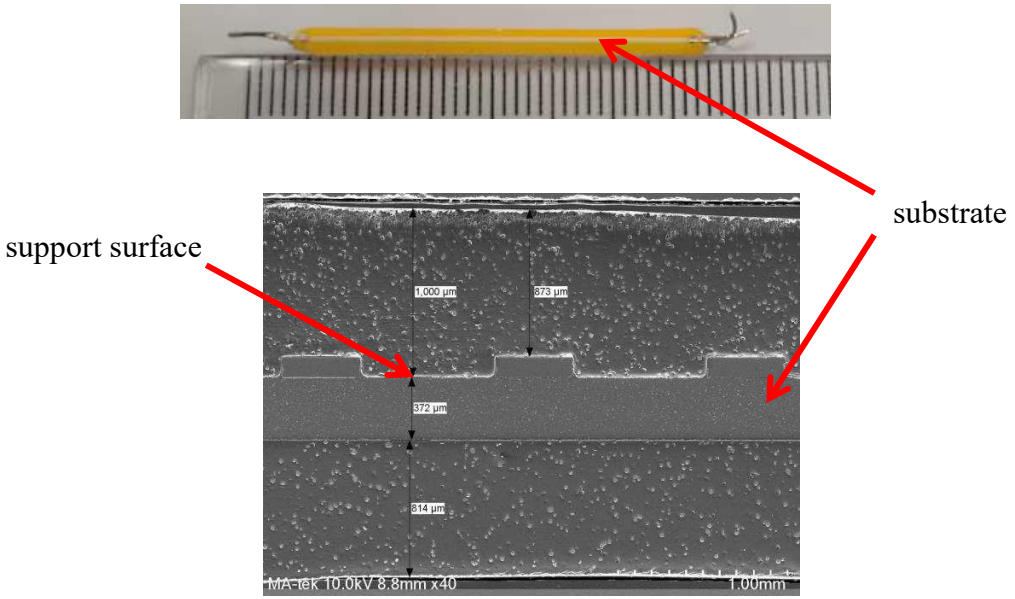
The Defendants infringe U.S. Patent No. 9,065,022 ("the '022 Patent") by making, using, selling, offering for sale, and importing at least certain GE Classic Series lightbulbs, GE Refresh Series lightbulbs, GE Relax Series lightbulbs, GE Basic Series lightbulbs, GE Reveal Series lightbulbs, and GE Vintage Series lightbulbs that include one or more LED filaments (the "Accused Product").

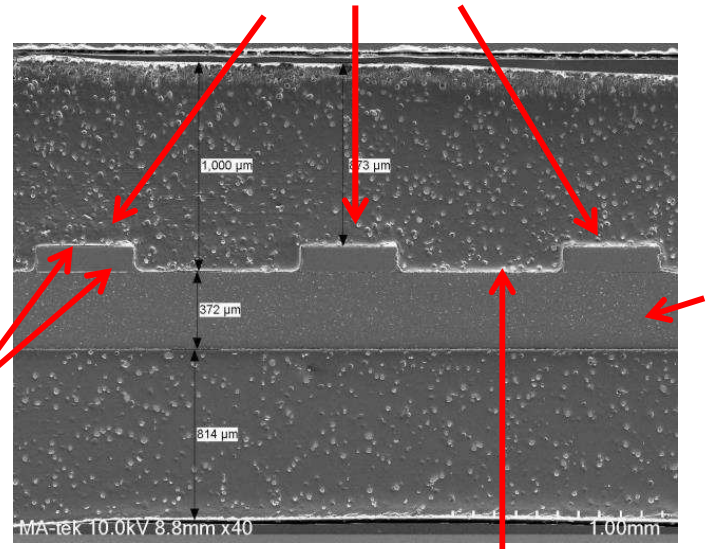
The asserted claims include elements that are implemented, at least in part, by proprietary hardware in the Accused Product. Plaintiff has provided these contentions based on analyzing the GE A19 Medium Base LED Filament Bulb as well as a review of the publicly available materials regarding the Accused Product. The chart is merely exemplary and may not show the functionality in its entirety. Furthermore, Plaintiff reserves the right to revise these contentions as discovery in the case progresses, in view of the Court's final claim construction in this action and in connection with expert reports.

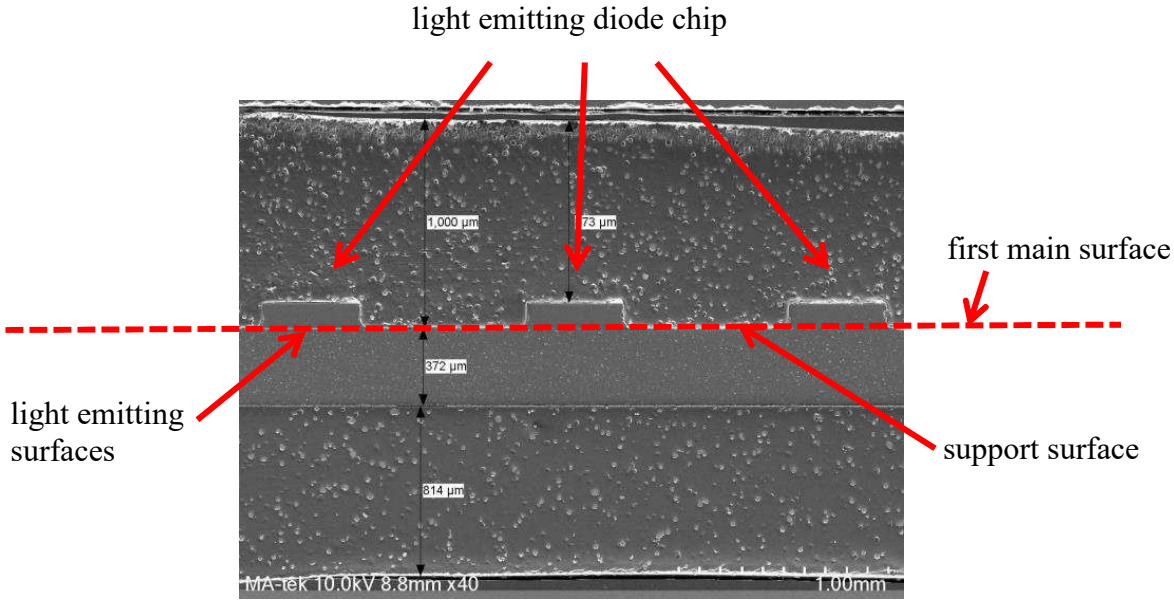
As one non-limiting example, at least the GE A19 Medium Base LED Filament Bulb includes the features cited in the chart below:

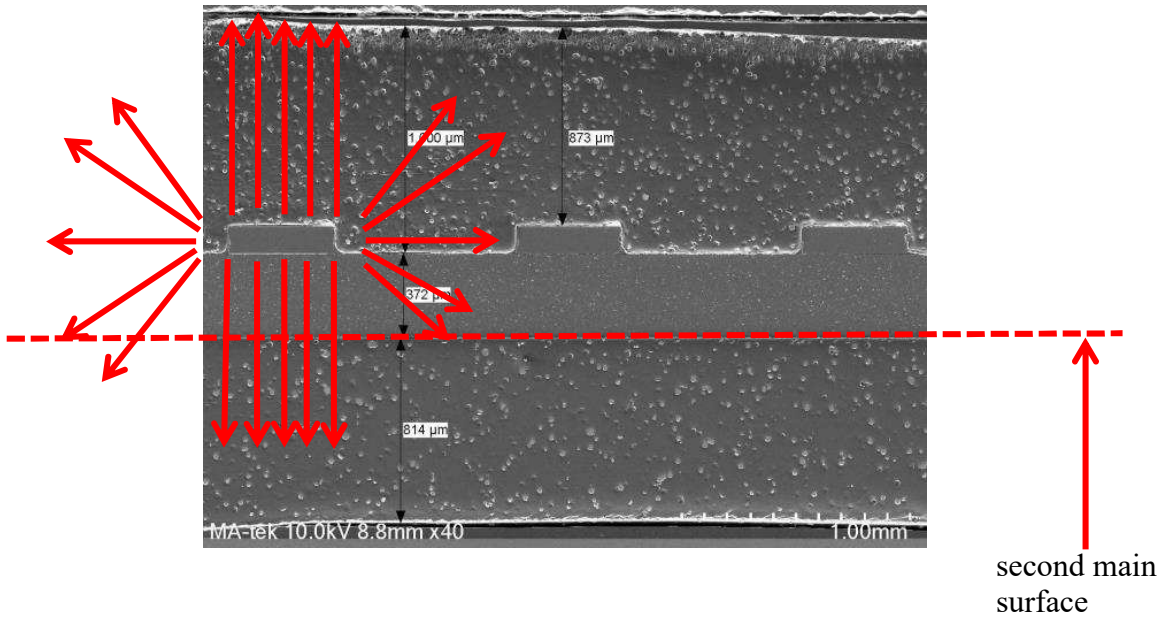
Claims	Exemplary Disclosures of Technical Features for GE A19 Medium Base LED Filament Bulb
1. A light emitting apparatus, comprising:	The GE A19 Medium Base LED Filament Bulb includes a light emitting apparatus. For example, as shown in the image below, the GE A19 Medium Base LED Filament Bulb includes a light-emitting apparatus.  

at least one light emitting device, including:	The GE A19 Medium Base LED Filament Bulb includes a light emitting device. For example, each of the GE A19 Medium Base LED Filament Bulb includes at least one LED filament. 
a substrate, having a support surface; and	The light emitting device of the GE A19 Medium Base LED Filament Bulb includes a substrate having a support surface. For example, as shown in the photo and the microscopic image below, each light emitting device of the GE A19 Medium Base LED Filament Bulb includes a transparent substrate with a support surface.

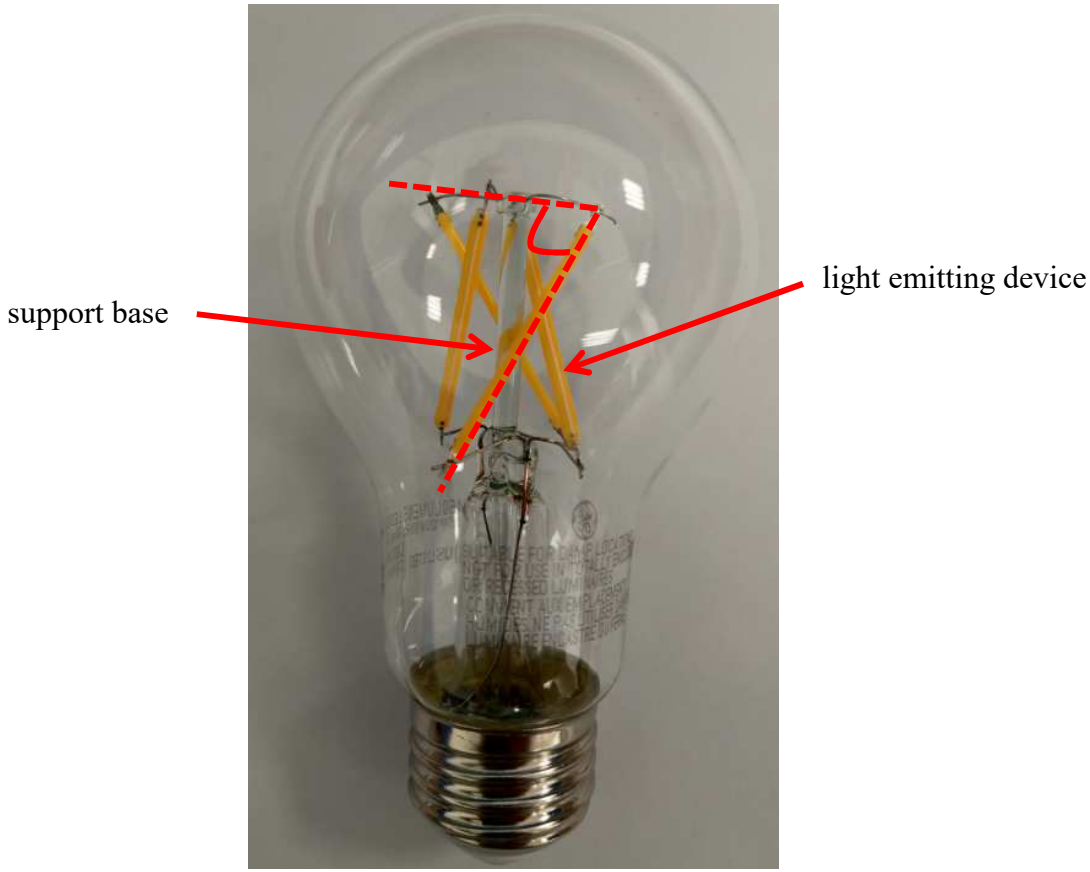

substrate
support surface
1,000 µm
873 µm
372 µm
814 µm
MA-tek 10.0kV 8.8mm x40
1.00mm

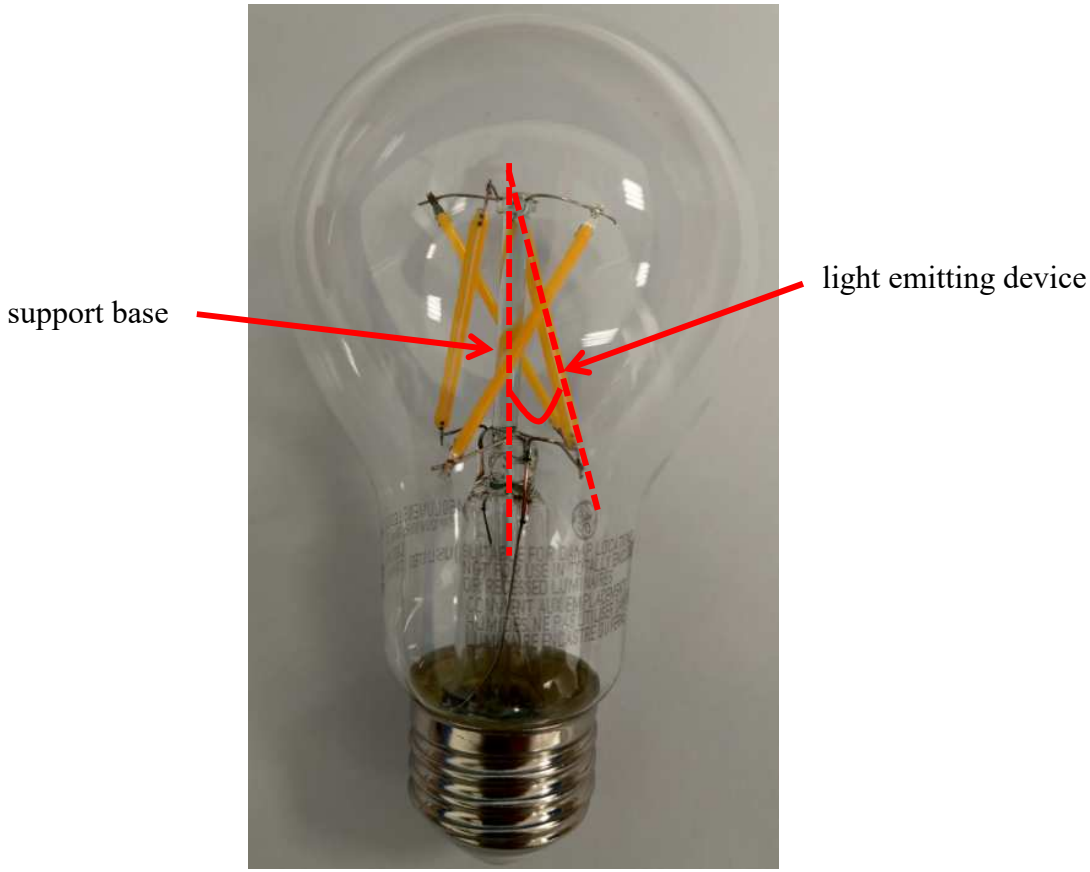
at least one light emitting diode chip comprising a plurality of light emitting surfaces, disposed on said support surface of said substrate,	The light emitting device of the GE A19 Medium Base LED Filament Bulb includes a plurality of light emitting diode chips disposed on the support surface, each of the light emitting diode chip includes a plurality of light-emitting surfaces. For example, as shown in the microscopic image below, there is a plurality of light emitting diode chips disposed on the support surface of the transparent substrate. Each light emitting diode chip includes a plurality of light emitting surfaces. light emitting diode chip  light emitting surfaces substrate support surface

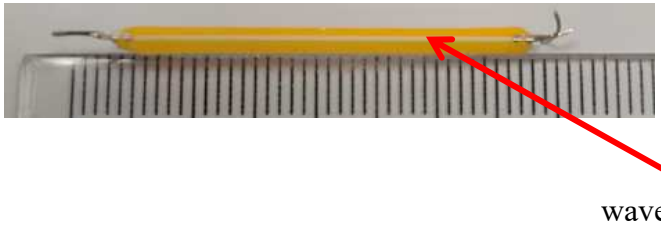
one of said light emitting surfaces and said support surface forming a first main surface, wherein	At least one of the light emitting surfaces of the light emitting chip disposed on a support surface of the GE A19 Medium Base LED Filament Bulb forms a first main surface. For example, as shown in the microscopic image below, the light emitting surface on the bottom side of the light emitting diode forms a main surface with the support surface. 

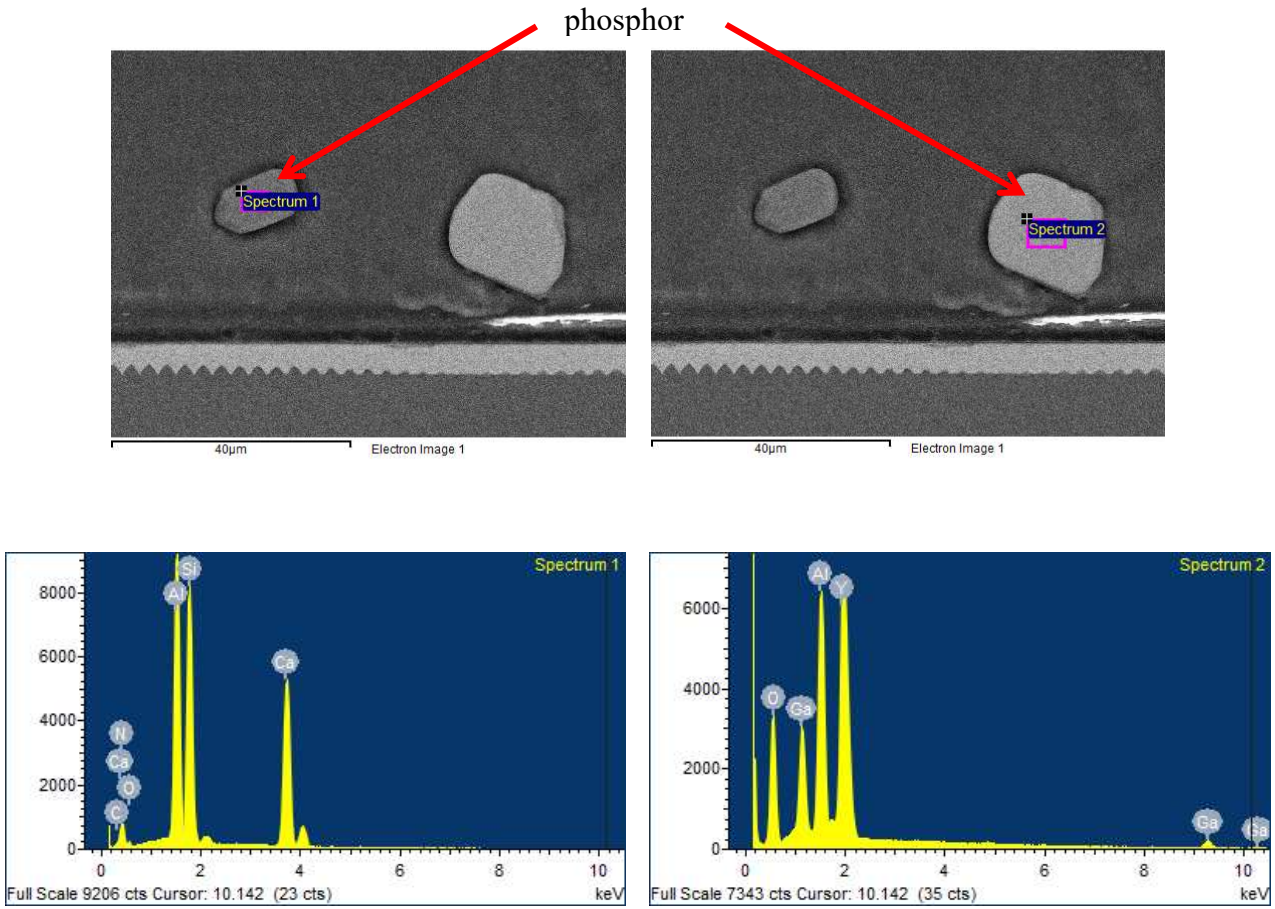
a light emitting angle of said light emitting diode chip is wider than 180°, and a portion of light emitted by said light emitting diode chip penetrates into said substrate from said support surface and emerges from a second main surface of said substrate opposing said first main surface; and	The light emitting diode chip of the GE A19 Medium Base LED Filament Bulb has a light emitting angle wider than 180°, and a portion of light emitted by said light emitting diode chip penetrates into said substrate from said support surface and emerges from a second main surface of said substrate opposing said first main surface. For example, as illustrated for one of the light emitting diode chip in the microscopic image below, the light emitting diode chip of the GE A19 Medium Base LED Filament Bulb illuminates light in all directions and passes through a second main surface located on the bottom side of the transparent substrate. 

a support base, coupled to said light emitting device, and forming a first angle with said substrate.	The GE A19 Medium Base LED Filament Bulb includes a support base, coupled to the light emitting device, and forming a first angle with the substrate. For example, as shown in the image below, the GE A19 Medium Base LED Filament Bulb includes a glass column with metal portions coupled to each filament and forming a first angle with the transparent substrate of the filament.

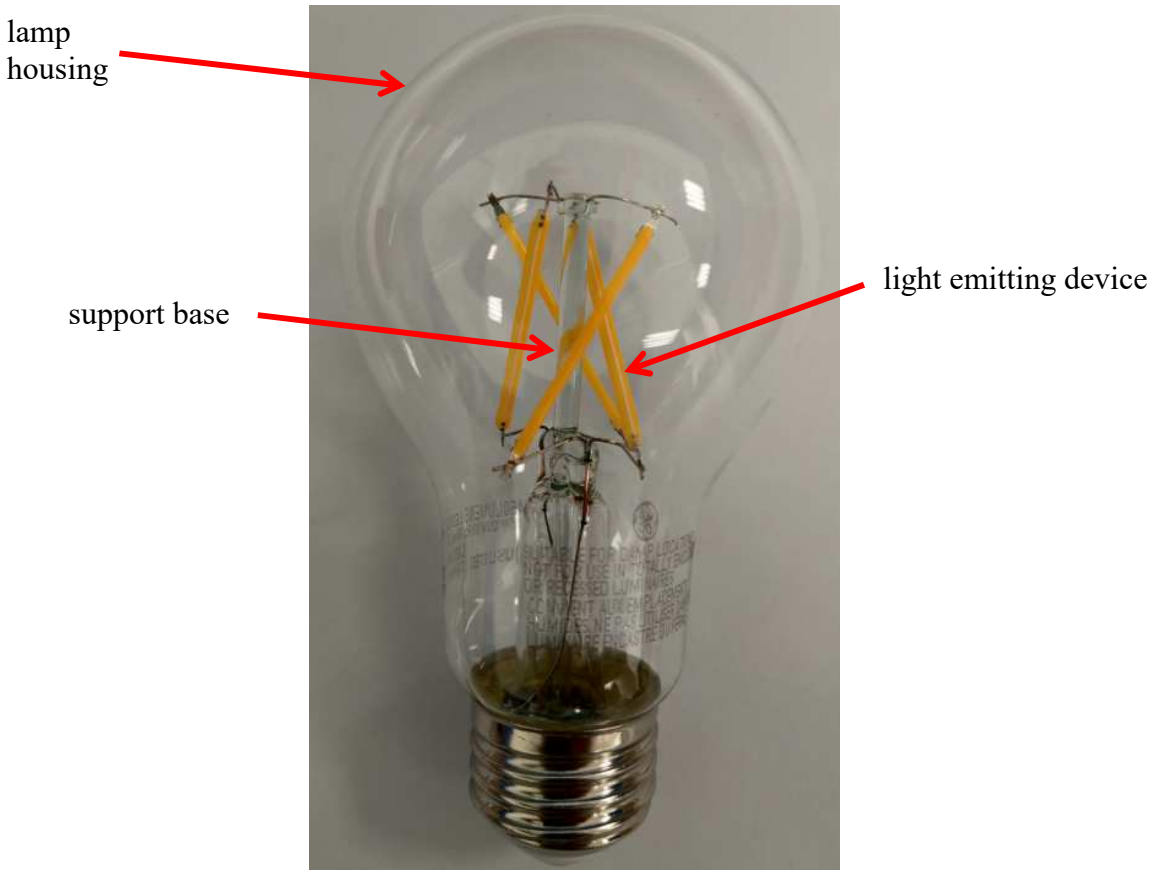

support base
light emitting device

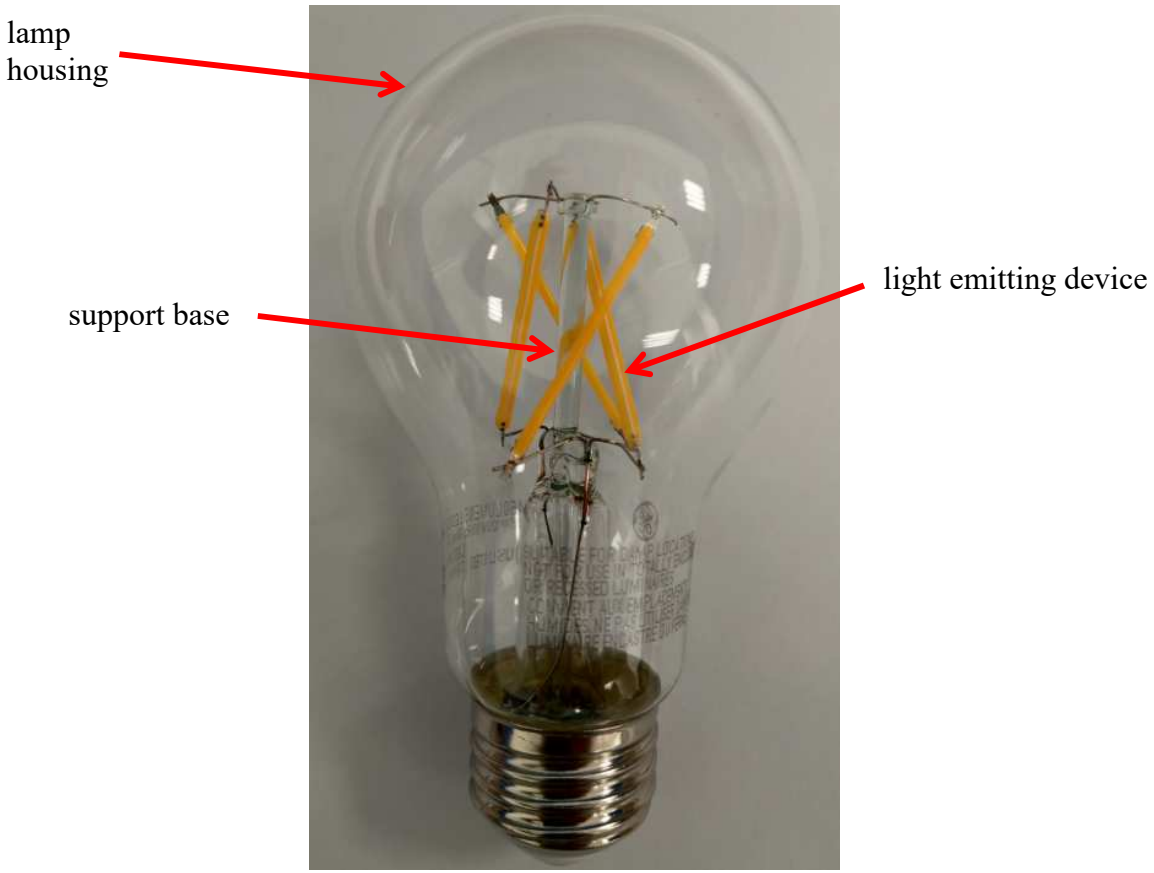

support base
light emitting device

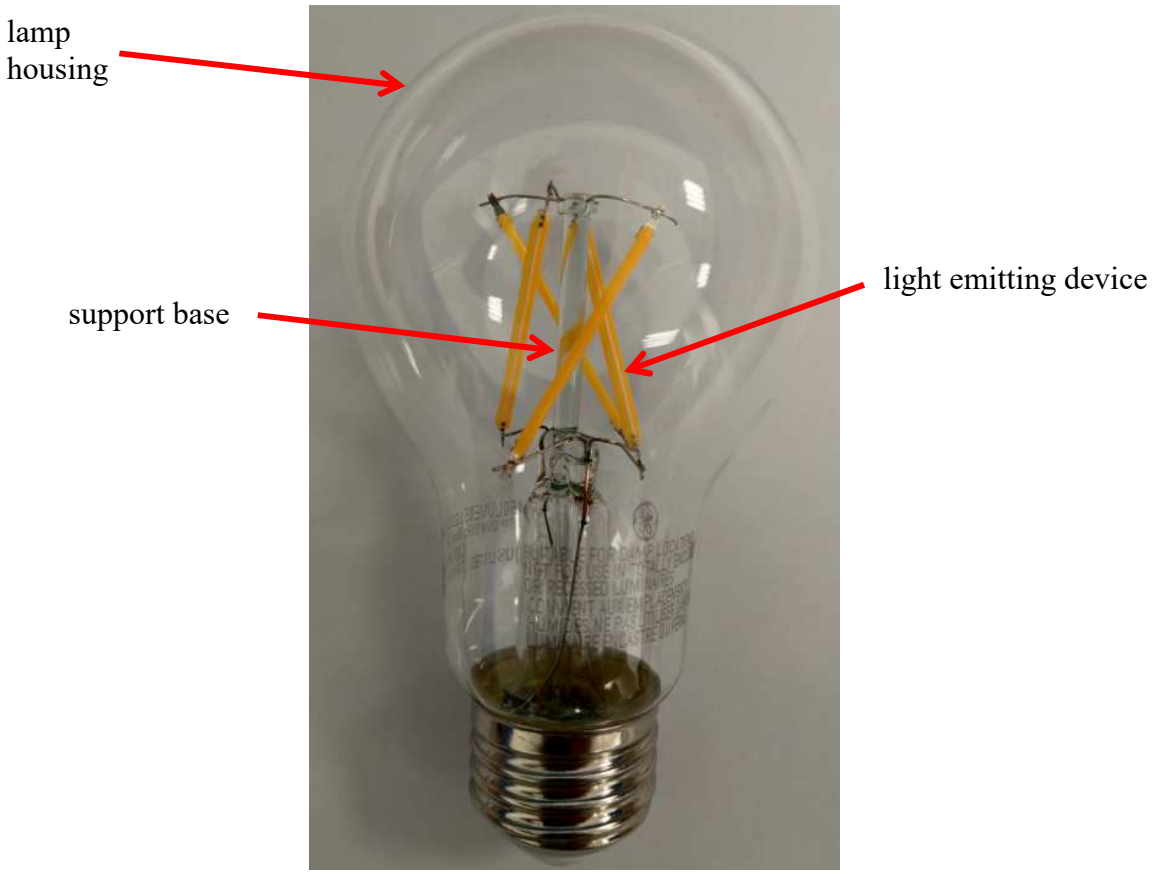
2. The light emitting apparatus of claim 1, further comprising a wavelength conversion layer disposed on said first main surface and/or on said second main surface of said light emitting device, wherein said wavelength conversion layer receives at least a portion of the light emitted by said light emitting diode chip and converts the wavelength thereof.	The light emitting device of the GE A19 Medium Base LED Filament Bulb includes a wavelength conversion layer disposed on said first main surface and/or on said second main surface of said light emitting device, wherein said wavelength conversion layer receives at least a portion of the light emitted by said light emitting diode chip and converts the wavelength thereof. For example, as shown in the photo and the microscopic images below, each light emitting device of the GE A19 Medium Base LED Filament Bulb includes a wavelength conversion layer containing phosphors that covers the filament, and the light emitted by the LED chips goes through and is changed by the wavelength conversion layer. 


phosphor
Spectrum 1
40µm
Electron Image 1
Spectrum 2
40µm
Electron Image 1
Spectrum 1
Si
Al
Ca
N
Ca
O
C
8000
6000
4000
2000
0
0
2
4
6
8
10
Full Scale 9206 cts Cursor: 10.142 (23 cts)
keV
Spectrum 2
Al
Y
O
Ca
Ga
Ga
6000
4000
2000
0
0
2
4
6
8
10
Full Scale 7343 cts Cursor: 10.142 (35 cts)
keV

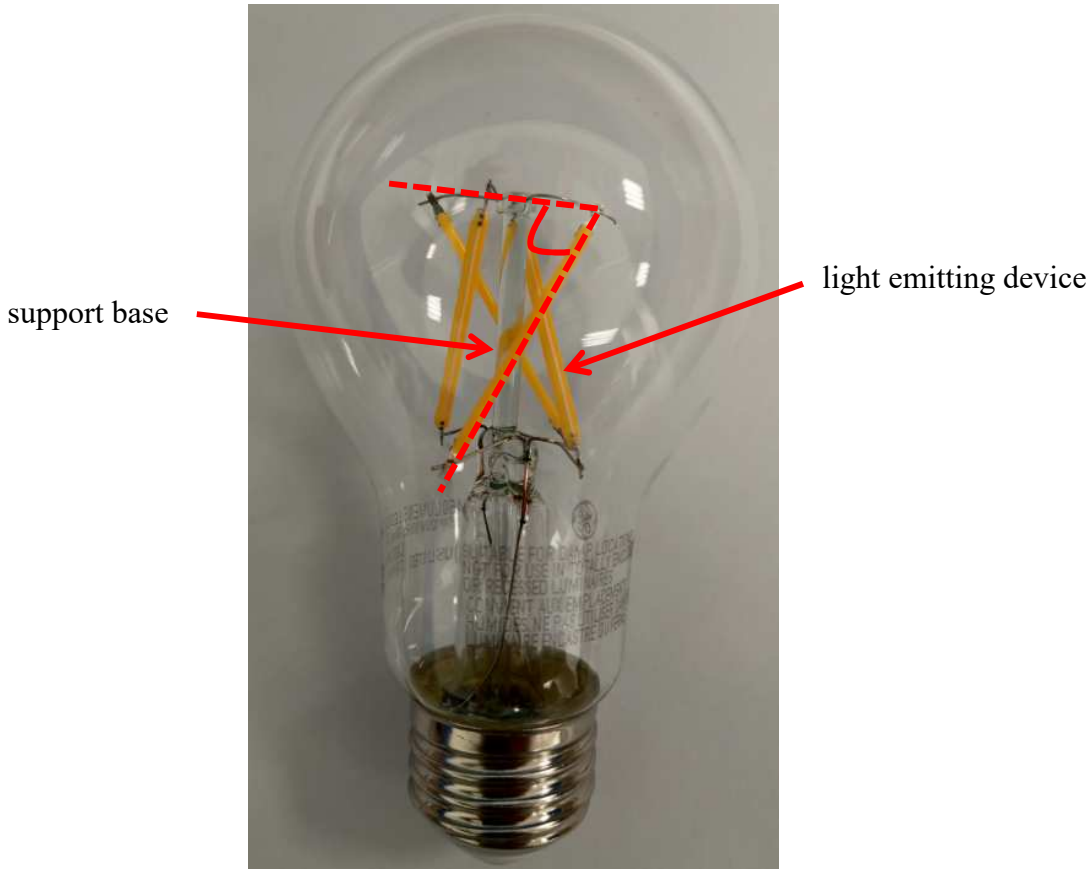
6. The light emitting apparatus of claim 1, further comprising a lamp housing, wherein at least a portion of said light emitting device is disposed in the room formed by said lamp housing.	The GE A19 Medium Base LED Filament Bulb includes a lamp housing, wherein at least a lamp housing, wherein at least a portion of said light emitting device is disposed in the room formed by said lamp housing. For example, as shown in the image below, the GE A19 Medium Base LED Filament Bulb includes a bulb that houses the light-emitting device.


lamp
housing
support base
light emitting device

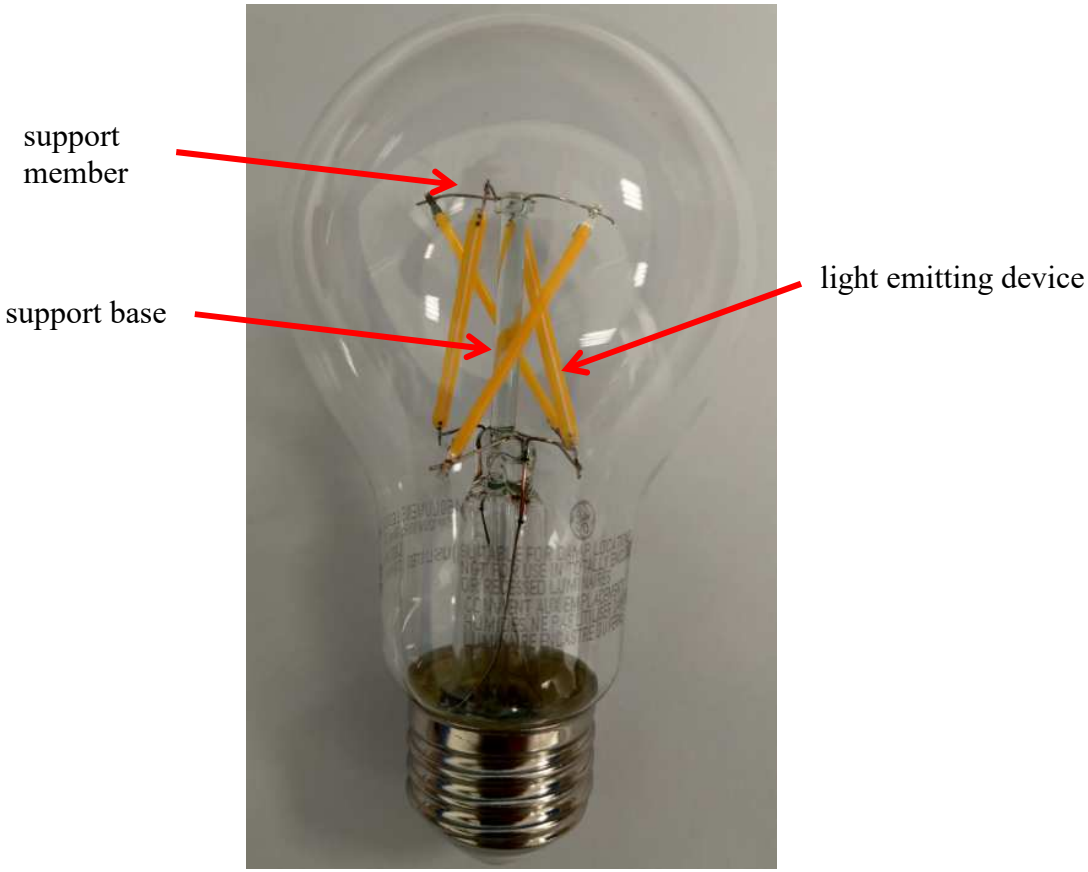
8. The light emitting apparatus of claim 6, wherein said lamp housing is coupled with said support base and at least partially covers said light emitting device.	The GE A19 Medium Base LED Filament Bulb includes a lamp housing, wherein the lamp housing is coupled with said support base and at least partially covers said light emitting device. For example, as shown in the image below, the bulb is coupled to the support base and covers at least partially the light-emitting device. 

9. The light emitting apparatus of claim 6, wherein said lamp housing is a tube, a bulb, or a box.	The GE A19 Medium Base LED Filament Bulb includes a lamp housing, wherein said lamp housing is a tube, a bulb, or a box. For example, as shown in the image below, the lamp housing is a bulb. 

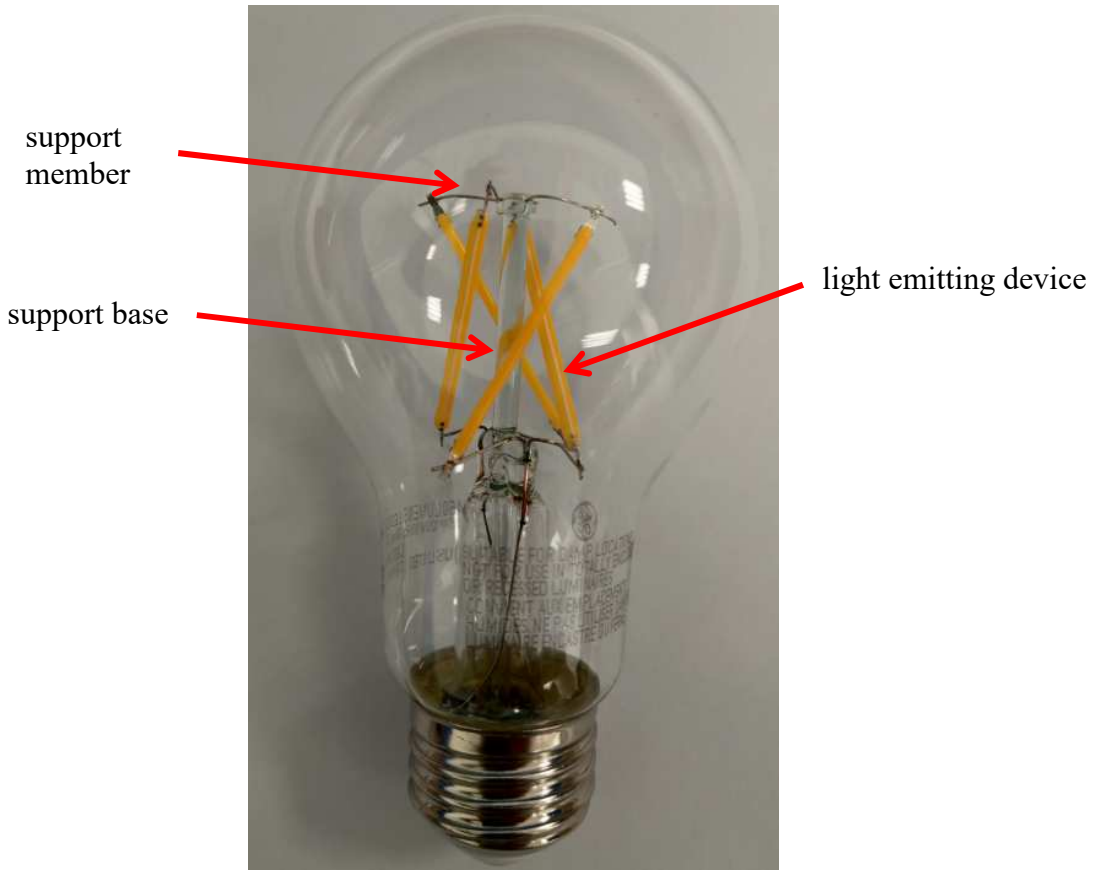
12. The light emitting apparatus of claim 1, wherein said first angle ranges from 30° to 150°.	The GE A19 Medium Base LED Filament Bulb includes a support base, coupled to the light emitting device, and forming a first angle with the substrate, wherein said first angle ranges from 30° to 150°. For example, as shown in the images below, the GE A19 Medium Base LED Filament Bulb includes a glass column coupled to each filament and forming a first angle with the transparent substrate of the filament that range from 30° to 150°.

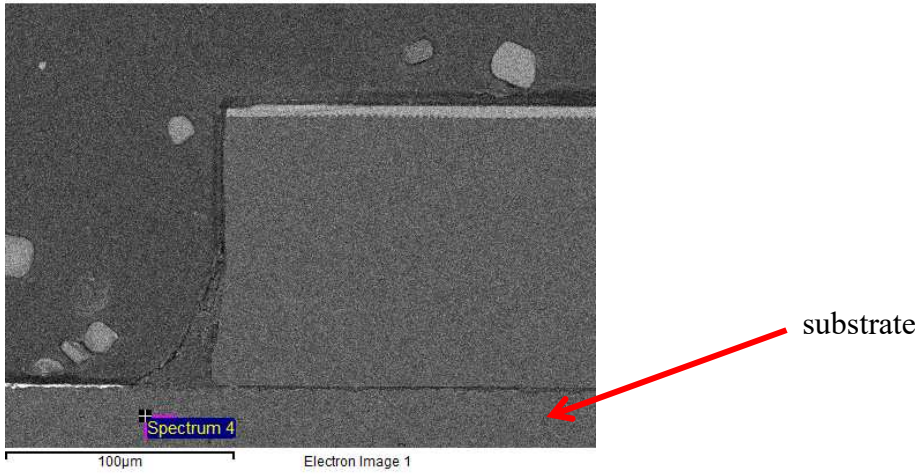

support base
light emitting device

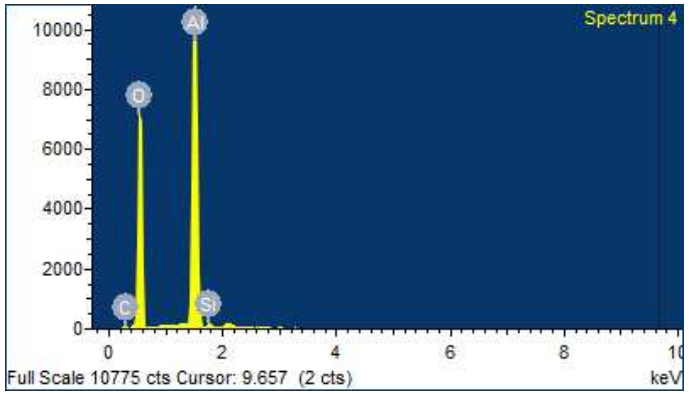
17. The light emitting apparatus of claim 1, wherein said support base includes a support member and said light emitting device is disposed on said support member.	The GE A19 Medium Base LED Filament Bulb includes a support base, wherein said support base includes a support member and said light emitting device is disposed on said support member. For example, as shown in the image below, the GE A19 Medium Base LED Filament Bulb includes a glass column coupled to each filament. The glass column is connected to one or more metal portions, where each filament is disposed on one or more metal portions.


support member
support base
light emitting device

19. The light emitting apparatus of claim 17, wherein said support member is flexible.	The GE A19 Medium Base LED Filament Bulb includes a support base, wherein said support base includes a support member, wherein said support member is flexible. For example, as shown in the image below, the GE A19 Medium Base LED Filament Bulb includes a glass column coupled to each filament. The glass column is connected to one or more metal portions, where each filament is disposed on one or more metal portions. The metal portions are flexible.


support member
support base
light emitting device

22. The light emitting apparatus of claim 1, wherein the material of said substrate is selected from the group consisting of aluminum oxide, sapphire, glass, plastics, and rubber.	The GE A19 Medium Base LED Filament Bulb includes a substrate, the material of which is selected from the group consisting of aluminum oxide, sapphire, glass, plastics, and rubber. For example, as shown in the microscopic image and material analysis below, the substrate of the GE A19 Medium Base LED Filament Bulb is made of aluminum oxide. 

	 Spectrum 4 Al O C Si 10000 8000 6000 4000 2000 0 0 2 4 6 8 Full Scale 10775 cts Cursor: 9.657 (2 cts) keV

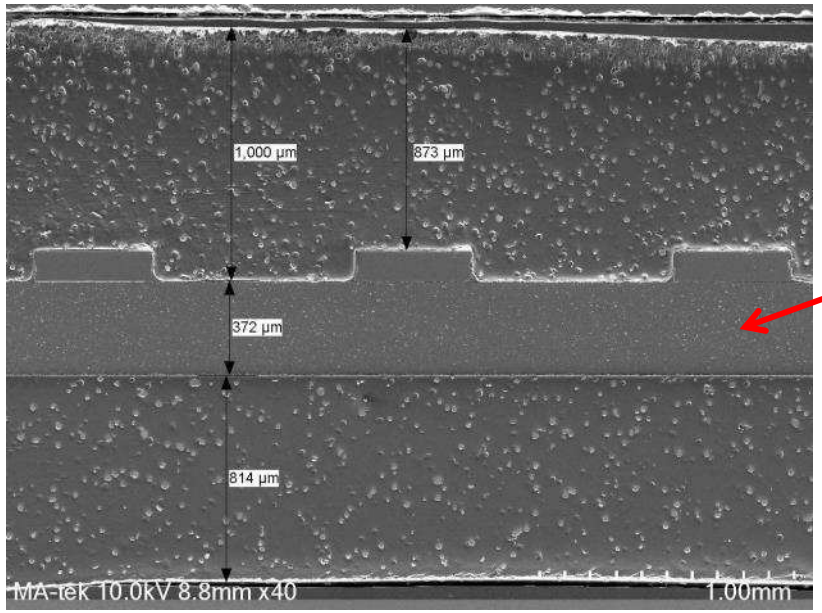
23. The light emitting apparatus of claim 1, wherein the thickness of said substrate is greater than or equal to 200µm.	The GE A19 Medium Base LED Filament Bulb includes a substrate with a thickness greater than or equal to 200µm. For example, as shown in the microscopic image below, the substrate of the GE A19 Medium Base LED Filament Bulb a thickness greater than 200µm. 

EXHIBIT 4

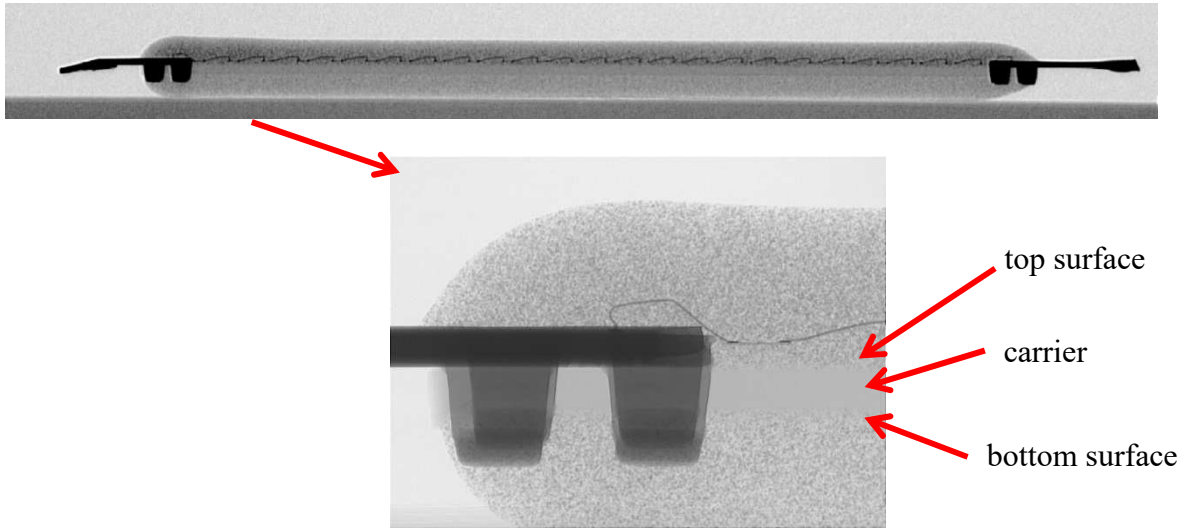
Exhibit 4: Infringement Claim Chart for U.S. Patent No. 9,664,340

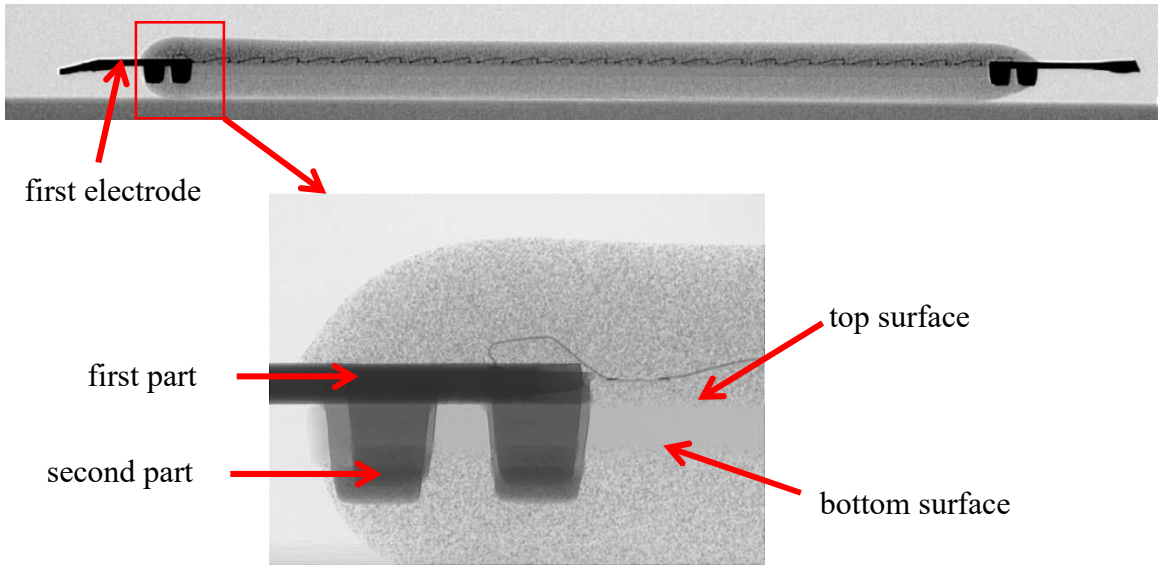
The Defendants infringe U.S. Patent No. 9,664,340 ("the '340 Patent") by making, using, selling, offering for sale, and importing at least certain GE Classic Series lightbulbs, GE Refresh Series lightbulbs, GE Relax Series lightbulbs, GE Basic Series lightbulbs, GE Reveal Series lightbulbs, and GE Vintage Series lightbulbs that include one or more LED filaments (the "Accused Product").

The asserted claims include elements that are implemented, at least in part, by proprietary hardware in the Accused Product. Plaintiff has provided these contentions based on analyzing the GE A19 Medium Base LED Filament Bulb as well as a review of the publicly available materials regarding the Accused Product. The chart is merely exemplary and may not show the functionality in its entirety. Furthermore, Plaintiff reserves the right to revise these contentions as discovery in the case progresses, in view of the Court's final claim construction in this action and in connection with expert reports.

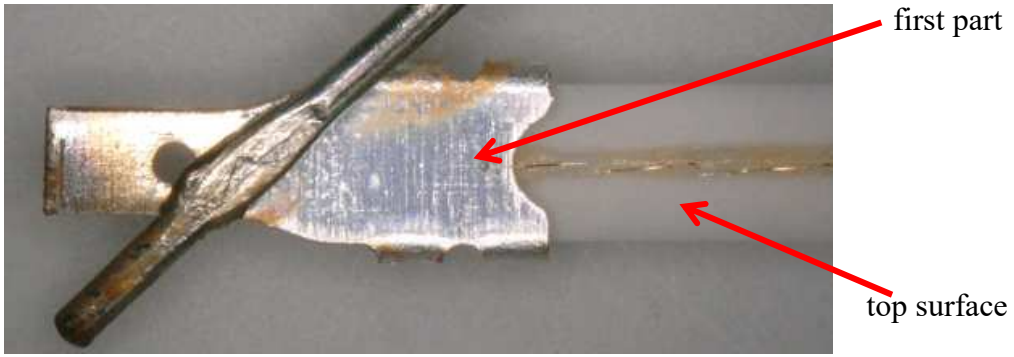
As one non-limiting example, at least the GE A19 Medium Base LED Filament Bulb includes the features cited in the chart below:

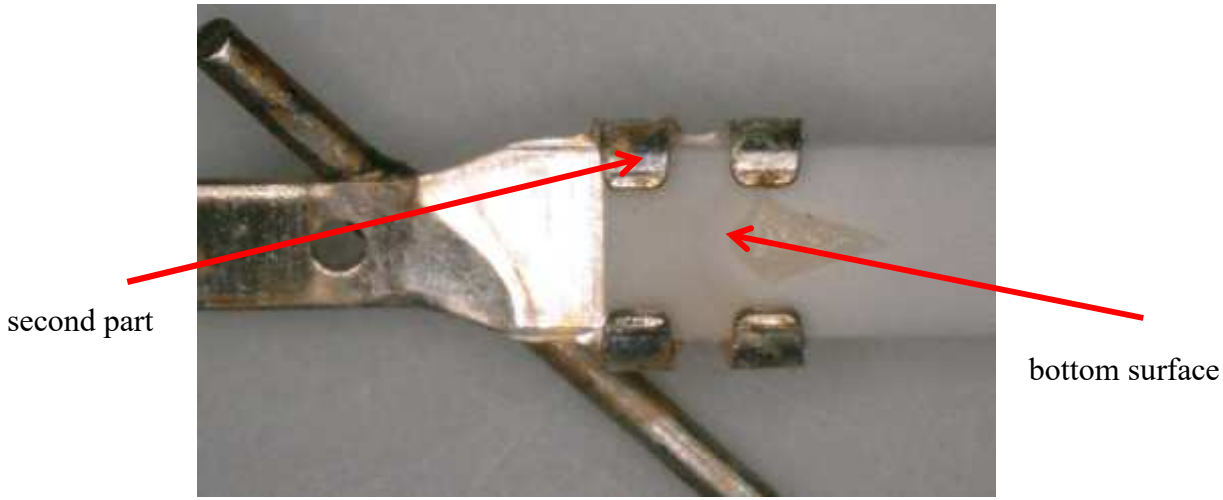
Claims	Exemplary Disclosures of Technical Features for GE A19 Medium Base LED Filament Bulb
1. A light-emitting device, comprising:	The GE A19 Medium Base LED Filament Bulb includes a light-emitting device. For example, as shown in the image below, the GE A19 Medium Base LED Filament Bulb includes a light-emitting device.  

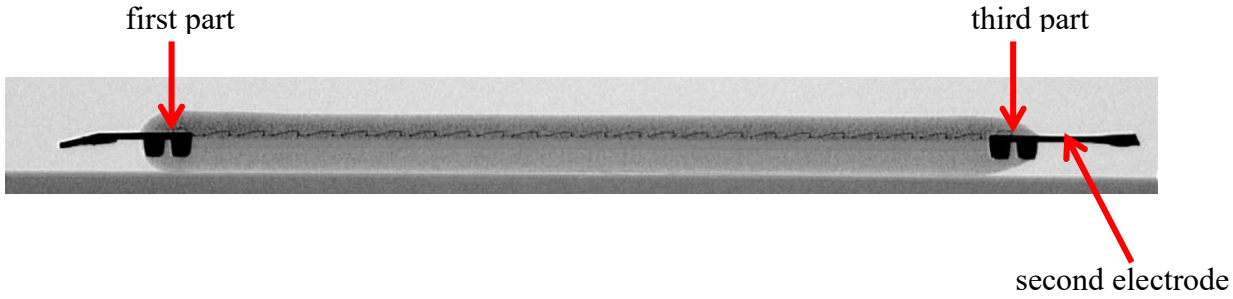
a carrier having a top surface and a bottom surface;	The GE A19 Medium Base LED Filament Bulb includes a carrier having a top surface and a bottom surface. For example, as shown in the microscopic images below, the GE A19 Medium Base LED Filament Bulb includes a plurality of filaments. Each filament has a transparent carrier having a top surface and a bottom surface. 
a first electrode having a first part formed on the top surface, and a second part formed on the bottom surface;	The GE A19 Medium Base LED Filament Bulb includes a first electrode having a first part formed on the top surface, and a second part formed on the bottom surface. As shown in the microscopic images below, each carrier of each filament includes a first electrode with a top part formed on the top surface of the carrier, and a bottom part formed on the bottom surface of the carrier.

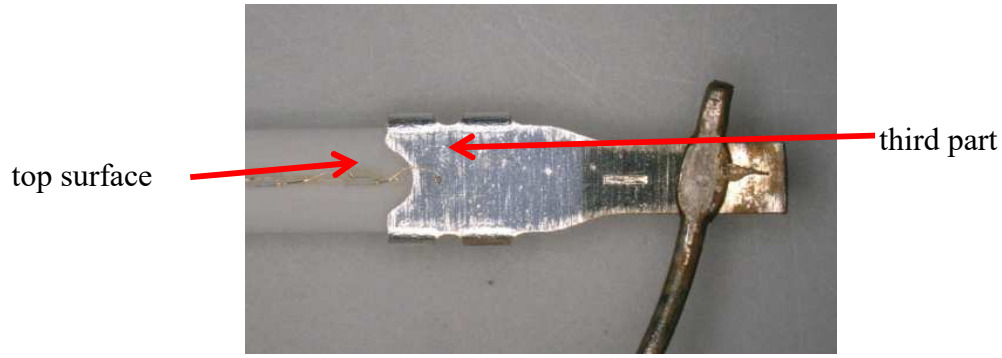


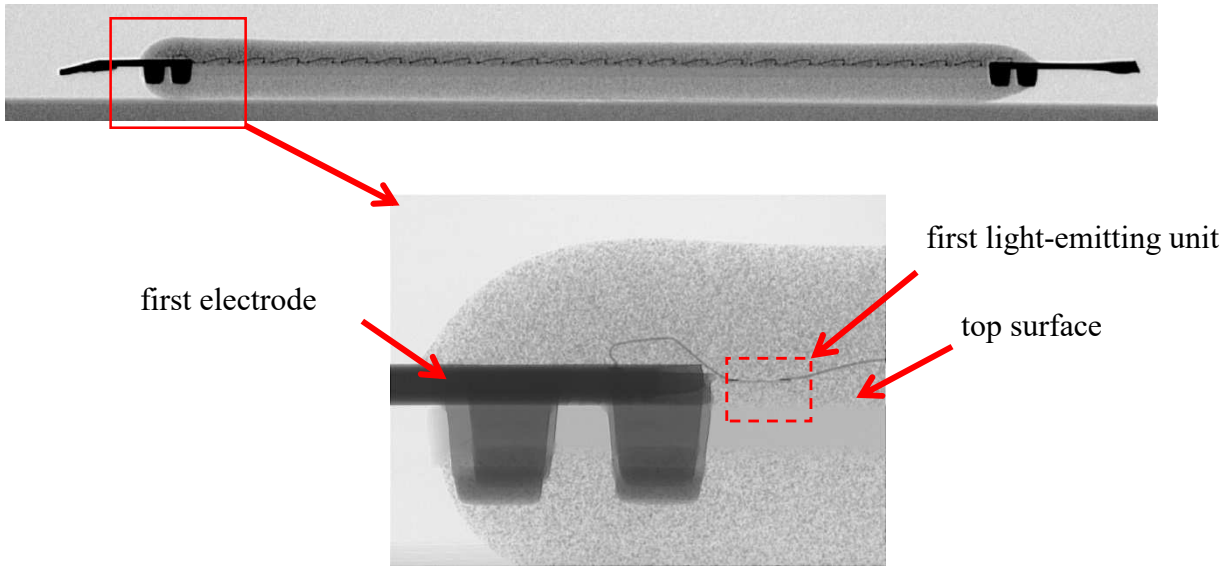
As further shown in the images below, each first electrode includes a first part formed on the top surface of the carrier, and a bottom part formed on the bottom surface of the carrier.

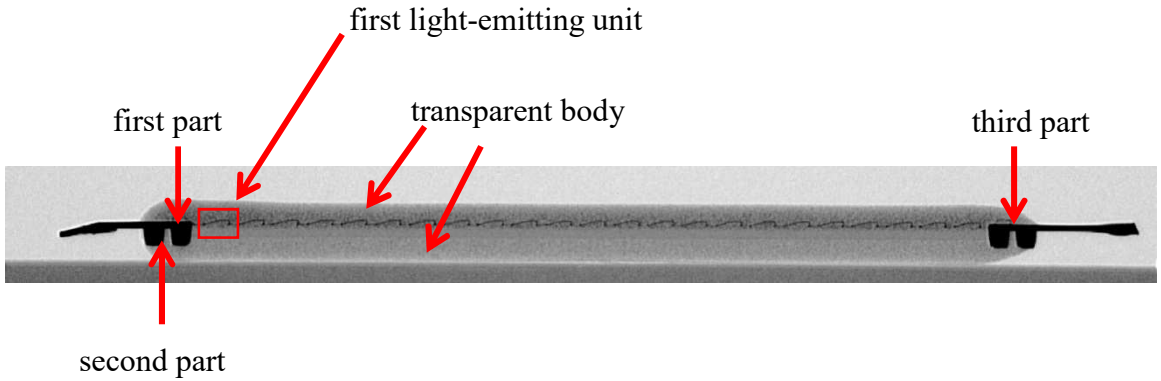


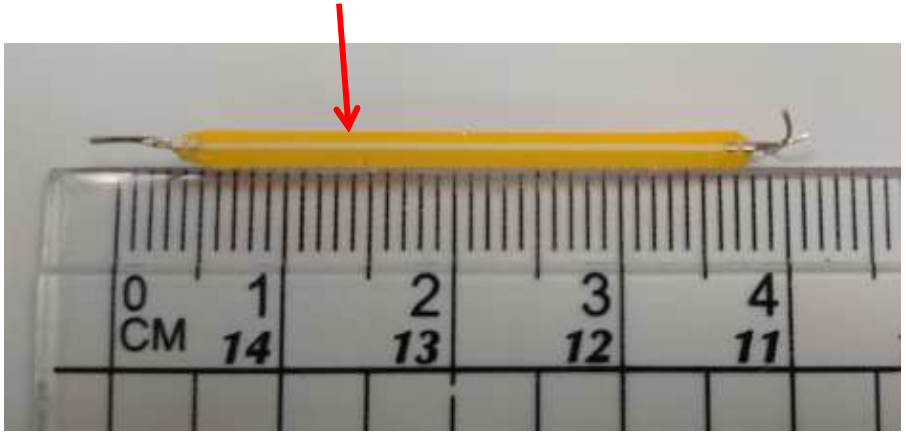
	 second part bottom surface

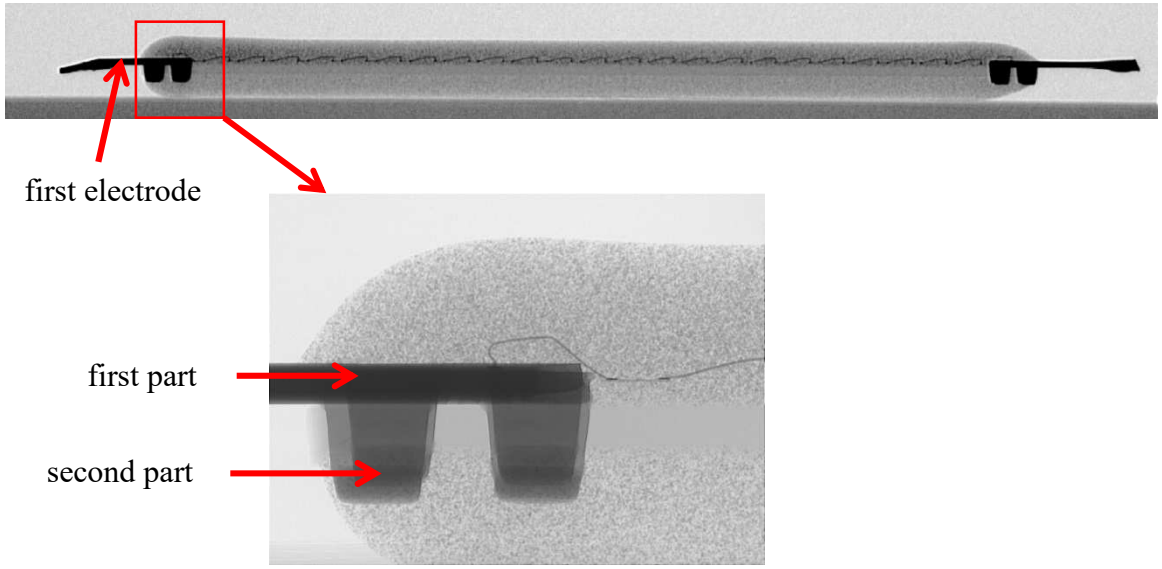
a second electrode having a third part formed on the top surface, wherein the first part and the third part are arranged at two opposite sides of the carrier;	The GE A19 Medium Base LED Filament Bulb includes a second electrode having a third part formed on the top surface, wherein the first part and the third part are arranged at two opposite sides of the carrier. As shown in the microscopic image below, each carrier of each filament includes a second electrode with a top part formed on the top surface of the carrier, the second electrode being positioned on the opposite side of the first electrode, the top part of the first electrode and the top part of the second electrode are arranged at two opposite sides of the carrier.  As further shown in the image below, each second electrode includes a third part formed on the top surface of the carrier.

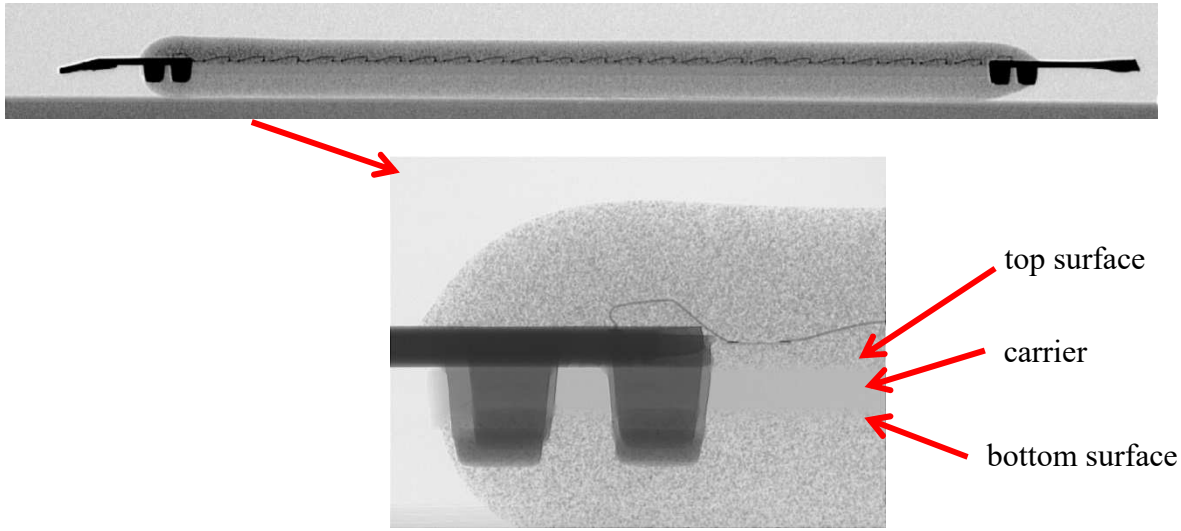
	 top surface third part

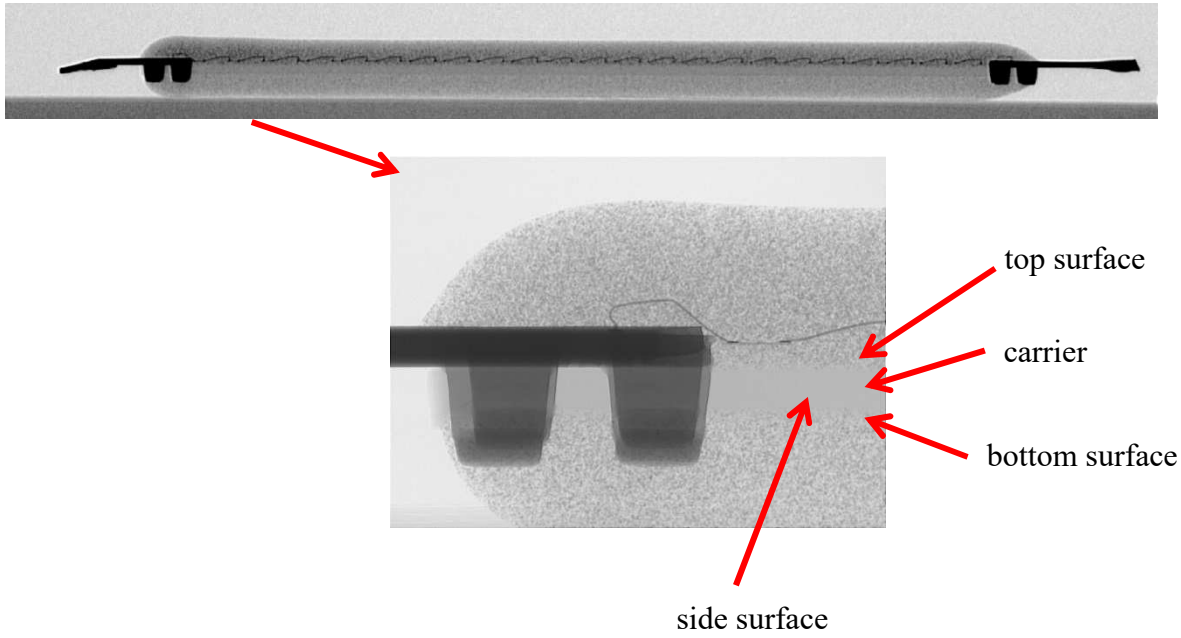
a first light-emitting unit disposed on the top surface and electrically connected to the first electrode; and	The GE A19 Medium Base LED Filament Bulb includes a first light-emitting unit disposed on the top surface and electrically connected to the first electrode. As shown in the microscopic images below, a LED chip is disposed on the top surface of the carrier and electrically connected to the first electrode. 

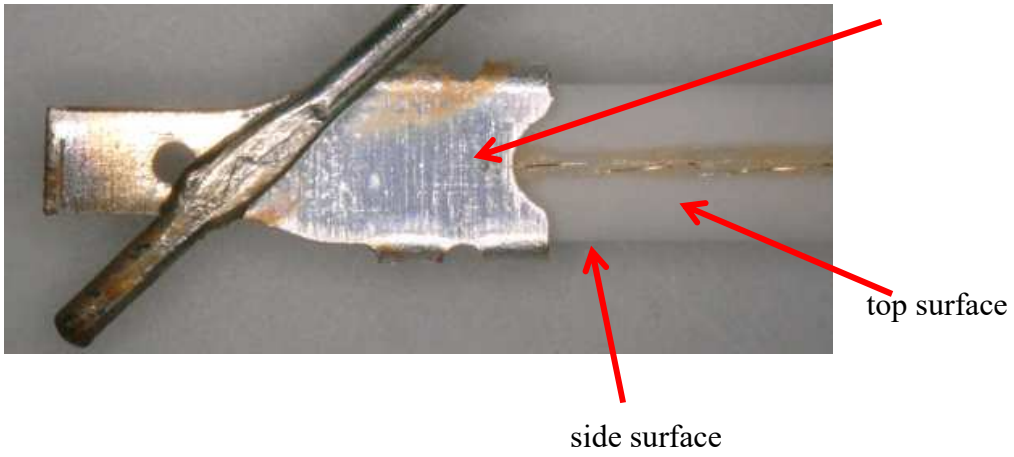
a transparent body covering the first part, the second part, the third part and the first light-emitting unit.	The GE A19 Medium Base LED Filament Bulb includes a transparent body covering the first part, the second part, the third part and the first light-emitting unit. As shown in the images below, the first and second electrodes of each carrier, including the top parts and bottom parts of the first and second electrodes, and a plurality of LED chips are covered by a transparent body. 

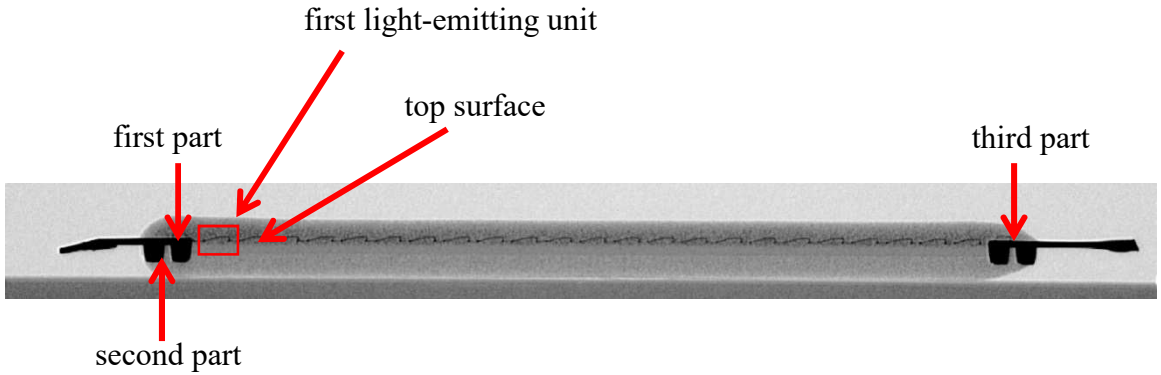
	transparent body 

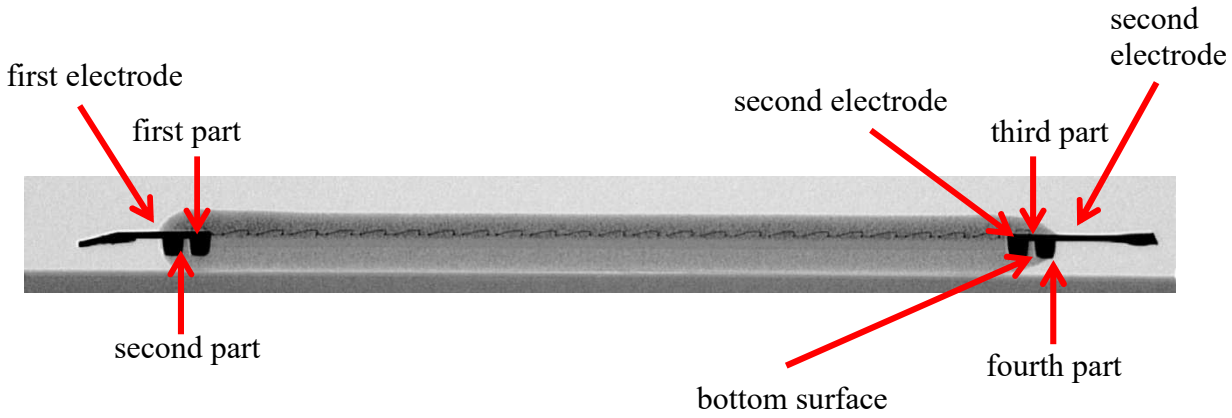
2. The light-emitting device of claim 1, wherein the first part overlaps the second part.	The GE A19 Medium Base LED Filament Bulb includes a first electrode having a first part formed on the top surface, and a second part formed on the bottom surface, wherein the first part overlaps the second part. As shown in the microscopic images below, each carrier of each filament includes a first electrode with a top part formed on the top surface of the carrier, and a bottom part formed on the bottom surface of the carrier. As shown, the first part overlaps the second part. 

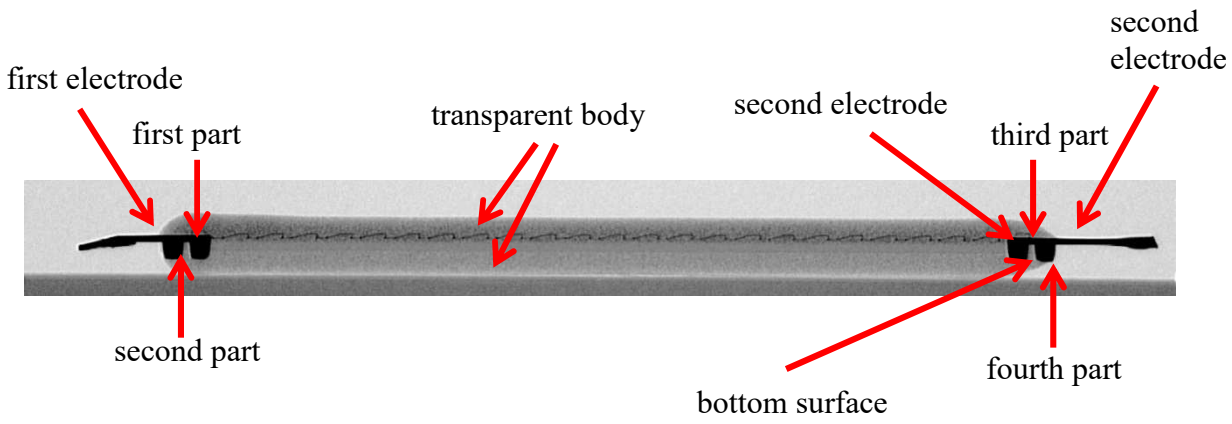
3. The light-emitting device of claim 1, wherein the carrier comprises a transparent material or a non-transparent material.	The GE A19 Medium Base LED Filament Bulb includes a carrier that comprises a transparent material. For example, as shown in the microscopic images below, the GE A19 Medium Base LED Filament Bulb includes a plurality of filaments. Each filament has a transparent carrier having a top surface and a bottom surface. 

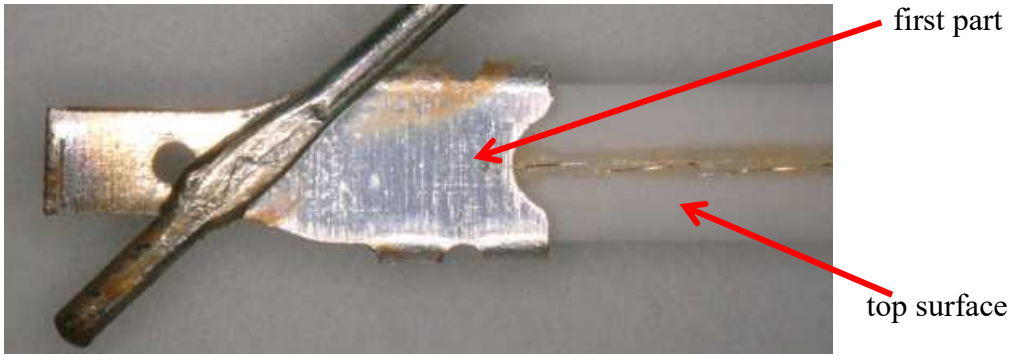
4. The light-emitting device of claim 1, wherein the carrier has a side surface and the first part extends beyond the side surface.	The GE A19 Medium Base LED Filament Bulb includes a carrier wherein the carrier has a side surface and the first part extends beyond the side surface. For example, as shown in the microscopic images below, the GE A19 Medium Base LED Filament Bulb includes a plurality of filaments. Each filament has a transparent carrier having a top surface and a bottom surface.  As further shown in the image below, the first part is formed on the top surface of the carrier, and extends beyond the side surface. first part

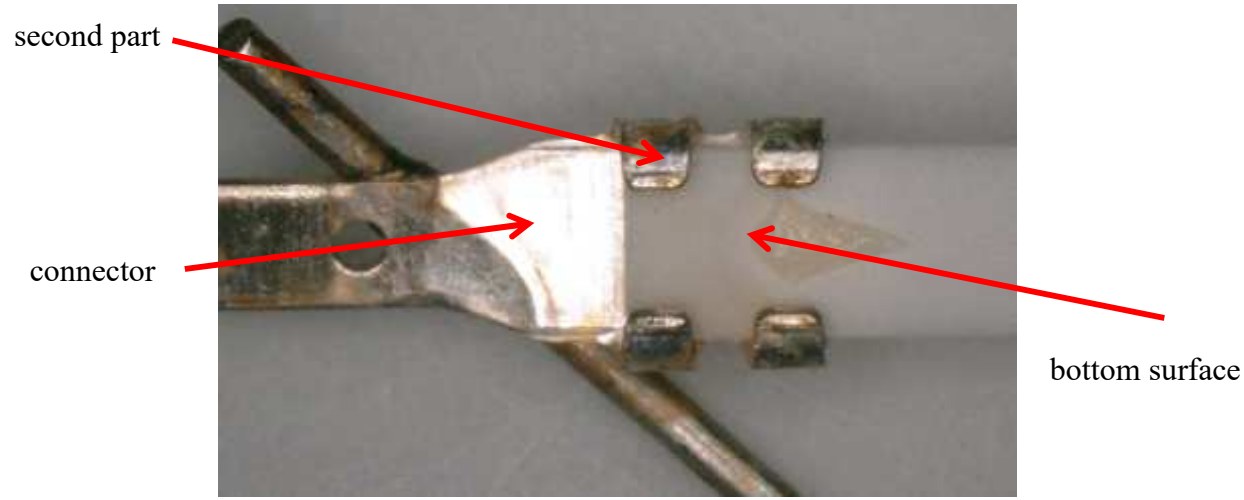
	 top surface side surface

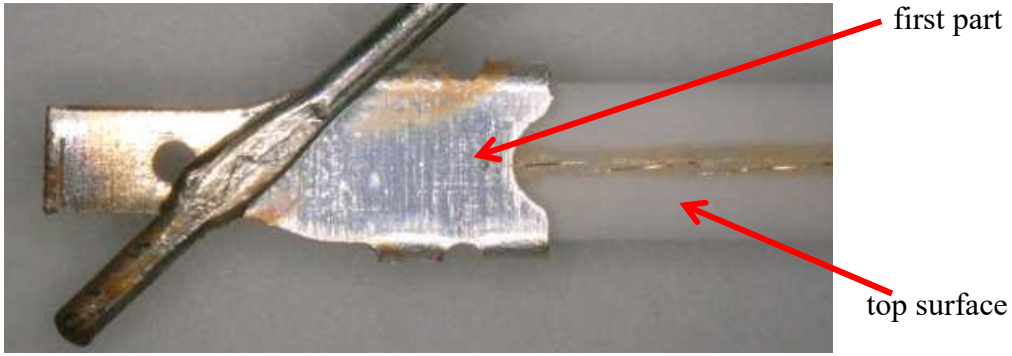
5. The light-emitting device of claim 1, wherein the first part and the third part are electrically separated from each other when the first light-emitting unit is not disposed on the top surface.	The GE A19 Medium Base LED Filament Bulb includes a first part, a second part, and a third part wherein the first part and the third part are electrically separated from each other when the first light-emitting unit is not disposed on the top surface. As shown in the image below, the first part is spaced apart from the third part, and when the first light-emitting unit is not disposed on the top surface, the first part and the third part are electrically separated from each other. 

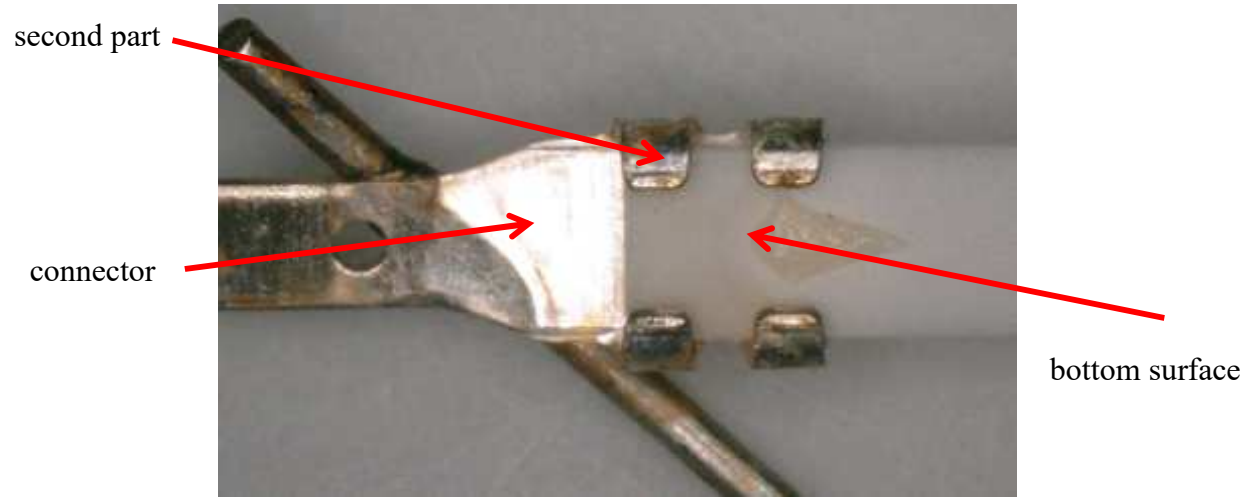
6. The light-emitting device of claim 1, wherein the second electrode has a fourth part formed on the bottom surface and electrically connected to the third part.	The GE A19 Medium Base LED Filament Bulb includes a first part, a second part, and a third part wherein the first part and the third part are electrically separated from each other when the first light-emitting unit is not disposed on the top surface. As shown in the image below, the second electrode has a fourth part formed on the bottom and electrically connected to the third part. 

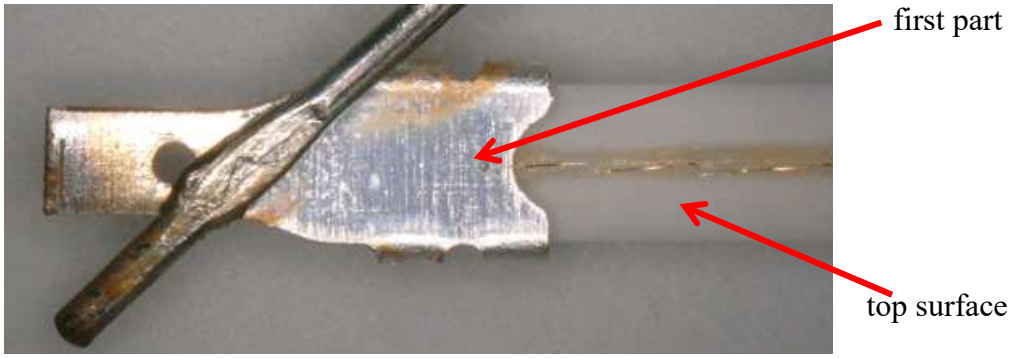
7. The light-emitting device of claim 6, wherein the transparent body covers the third part and fourth part.	The GE A19 Medium Base LED Filament Bulb includes a transparent body that covers the third part and fourth part. As shown in the image below, the transparent body covers the third part and fourth part. 

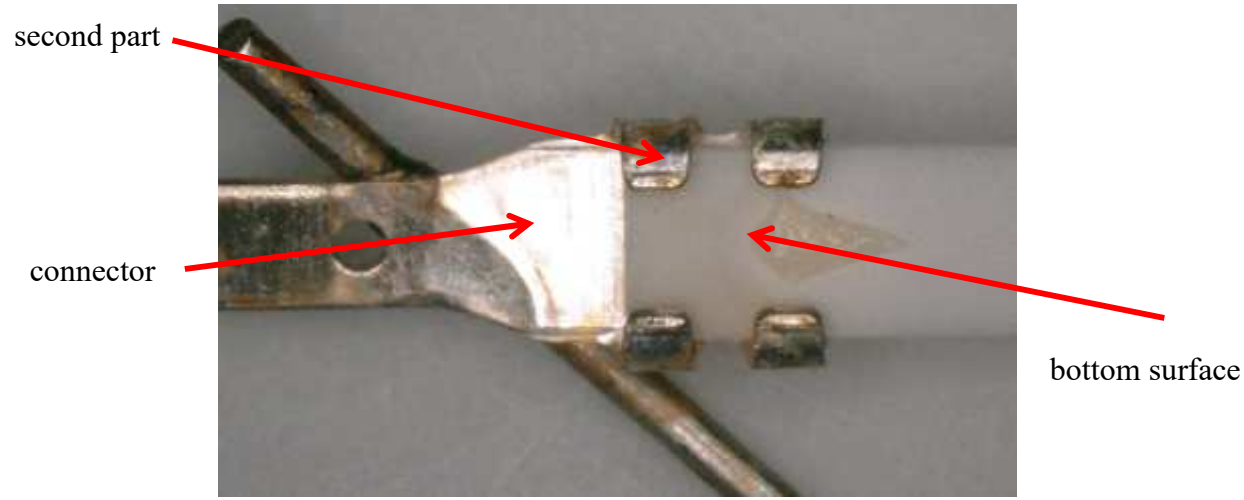
8. The light-emitting device of claim 1, further comprising a connector electrically and physically connected to the first part and the second part.	The GE A19 Medium Base LED Filament Bulb includes a connector electrically and physically connected to the first part and the second part. As shown in the images below, the first part is electrically connected to the second part via a connector. 

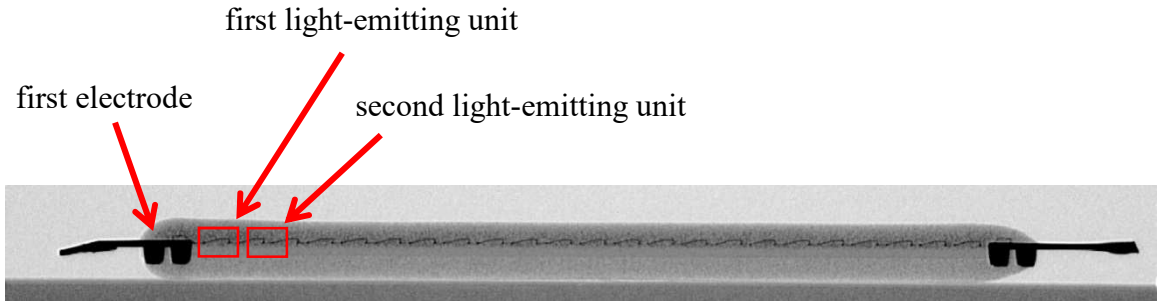
	 second part connector bottom surface

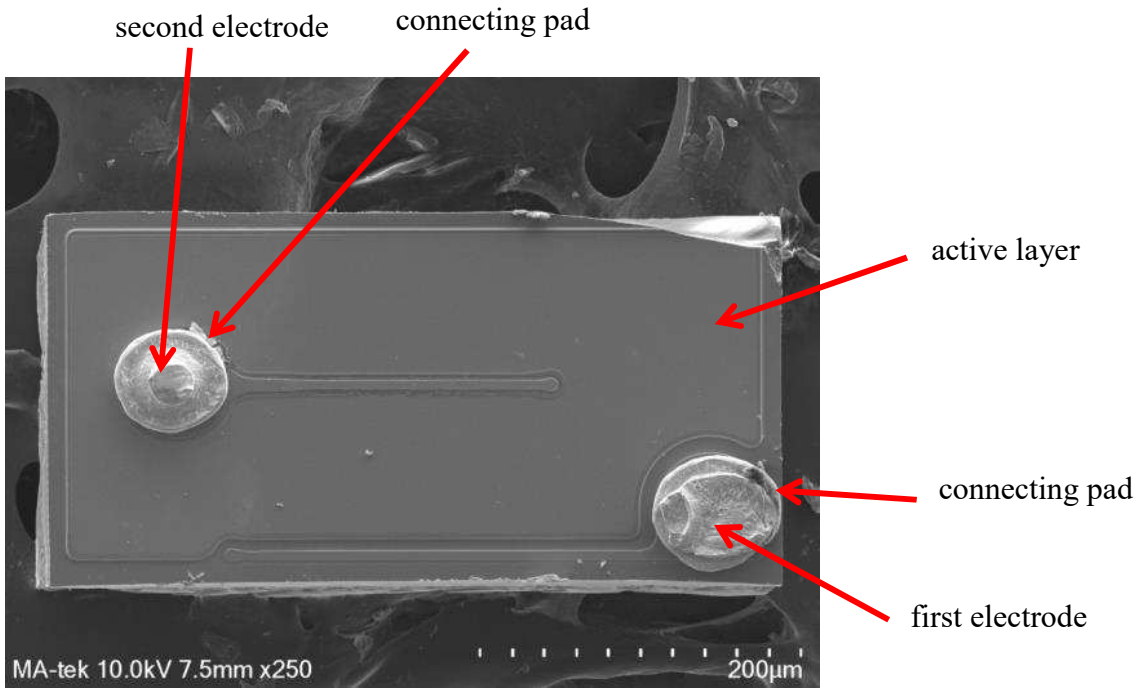
9. The light-emitting device of claim 8, wherein the connector covers a side surface of the carrier.	The GE A19 Medium Base LED Filament Bulb includes a connector electrically and physically connected to the first part and the second part, wherein the connector covers a side surface of the carrier. As shown in the images below, the connector wraps around the carrier and covers a side surface of the carrier. 

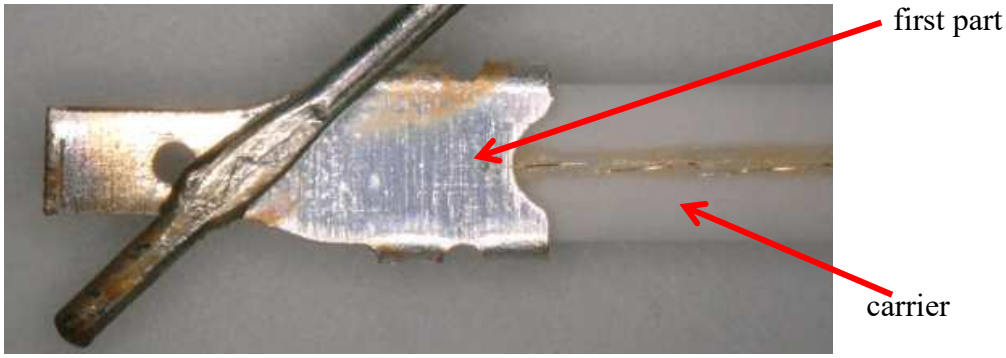
	 second part connector bottom surface

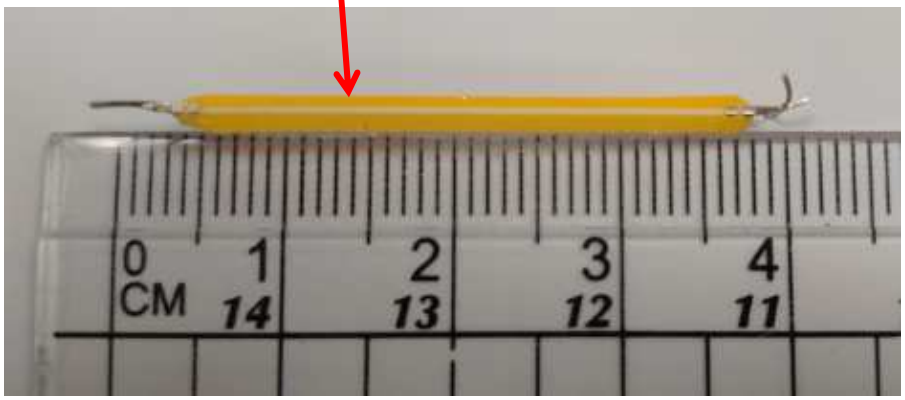
10. The light-emitting device of claim 8, wherein the connector is shorter than the first part.	The GE A19 Medium Base LED Filament Bulb includes a connector that is shorter than the first part. As shown in the images below, the connector wraps around the carrier and is shorter than the first part. 

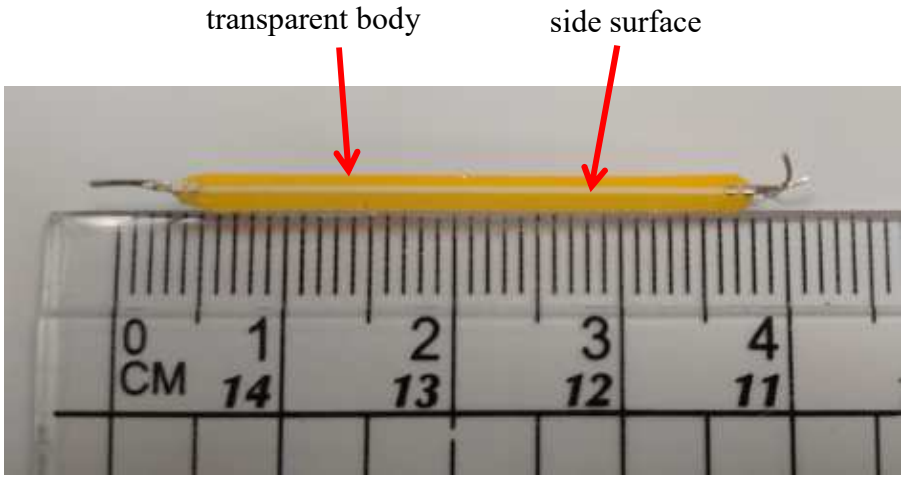
	 second part connector bottom surface

11. The light-emitting device of claim 1, further comprising a second light-emitting unit, wherein the second light-emitting unit and the first electrode are arranged on opposite sides of the first light-emitting unit.	The GE A19 Medium Base LED Filament Bulb includes a second light-emitting unit, wherein the second light-emitting unit and the first electrode are arranged on opposite sides of the first light-emitting unit. As illustrated in the image below, a second light-emitting unit is arranged on the right of the first light light-emitting unit, where the first electrode is arranged on the left side of the first light-emitting unit. 

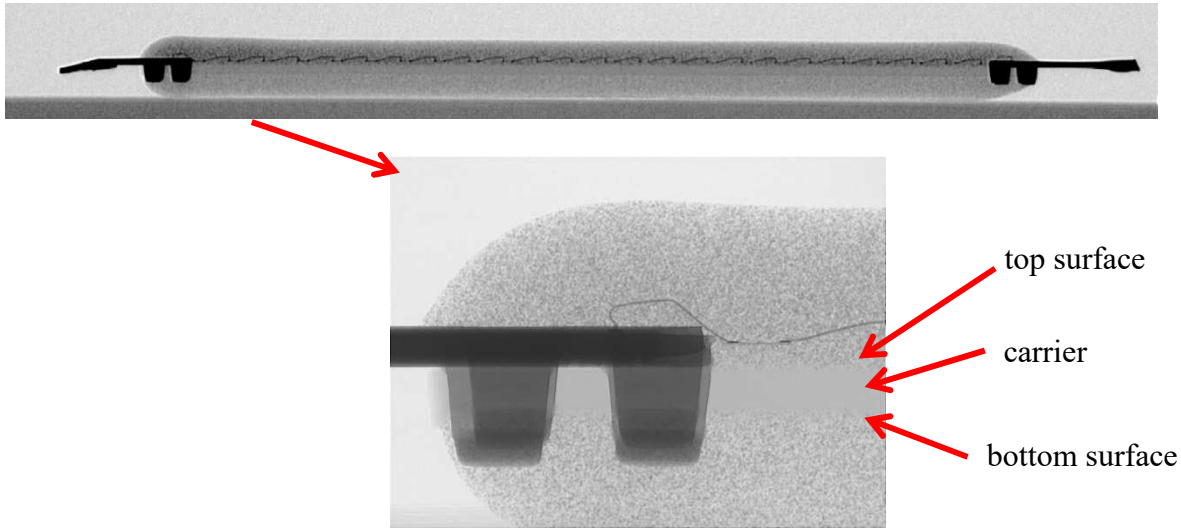
13. The light-emitting device of claim 1, wherein the first light-emitting unit comprises a plurality of connecting pads, the plurality of connecting pads is formed on a same side of the first light-emitting unit.	The GE A19 Medium Base LED Filament Bulb includes a plurality of connecting pads in the first light-emitting unit, the plurality of connecting pads is formed on a same side of the first light-emitting unit. For example, as shown in the images below, the GE A19 Medium Base LED Filament Bulb includes a plurality of connecting pads on a same side of the first light-emitting unit under the electrodes. 

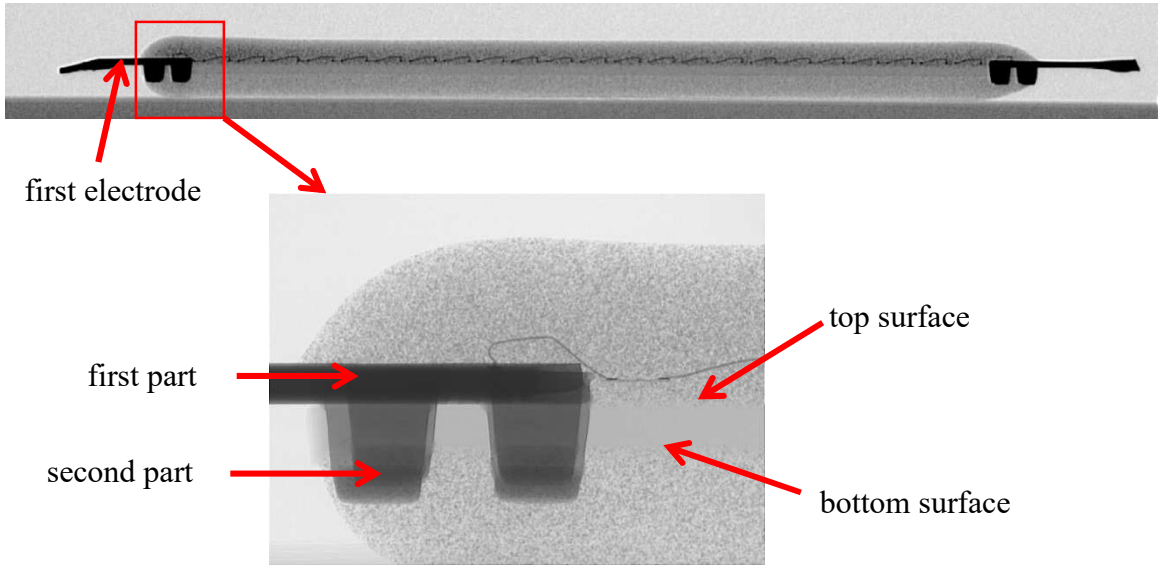
14. The light-emitting device of claim 1, wherein the first electrode fully covers an end portion of the carrier in a top view.	The GE A19 Medium Base LED Filament Bulb includes a first electrode fully covering an end portion of the carrier in a top view. As shown in the images below, the first electrode fully wraps around an end portion of the carrier in a top view. 

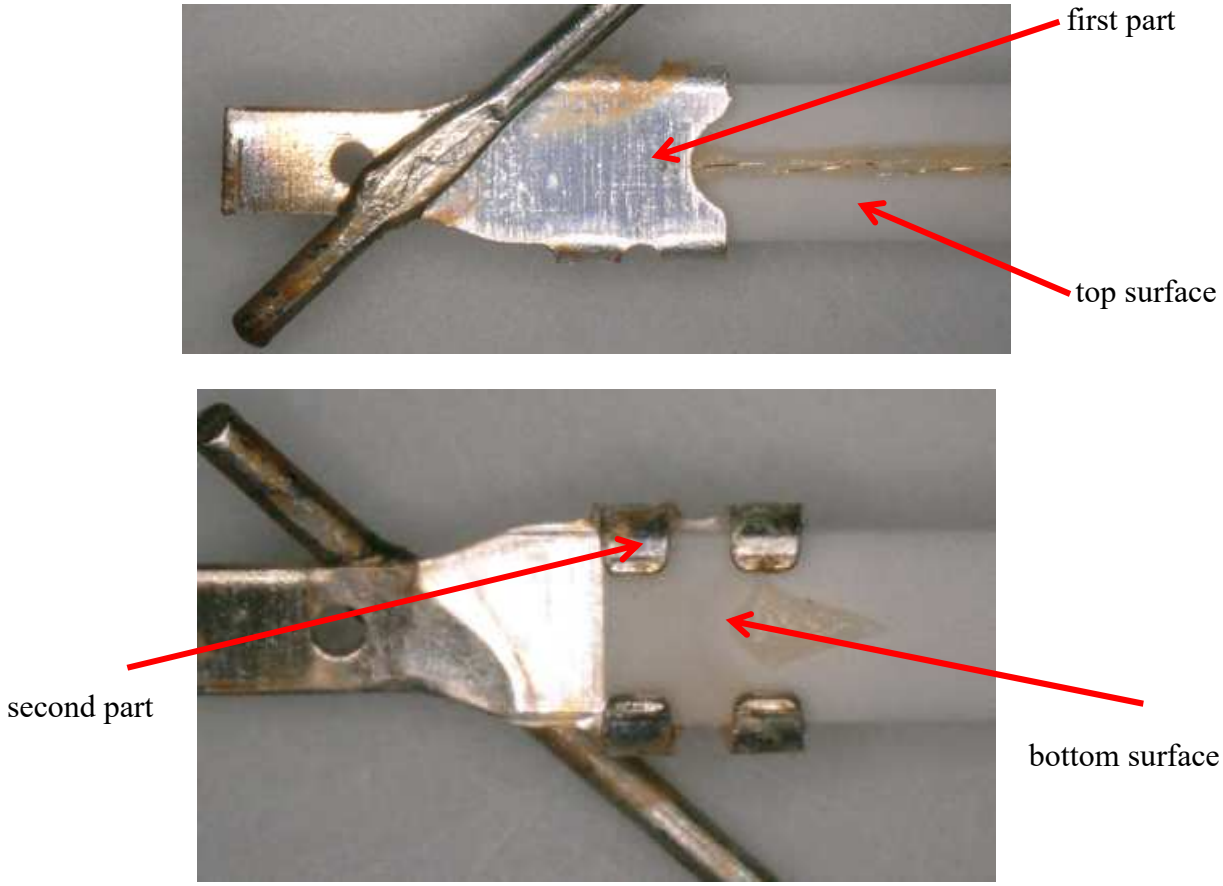
15. The light-emitting device of claim 1, wherein the transparent body comprises a wavelength conversion layer.	The GE A19 Medium Base LED Filament Bulb includes a transparent body wherein the transparent body comprises a wavelength conversion layer. As illustrated in the image below, a transparent body covers the carrier, the plurality of light-emitting units (chips). The transparent body alters the light wavelength as light emits from the light-emitting units (chips). transparent body 

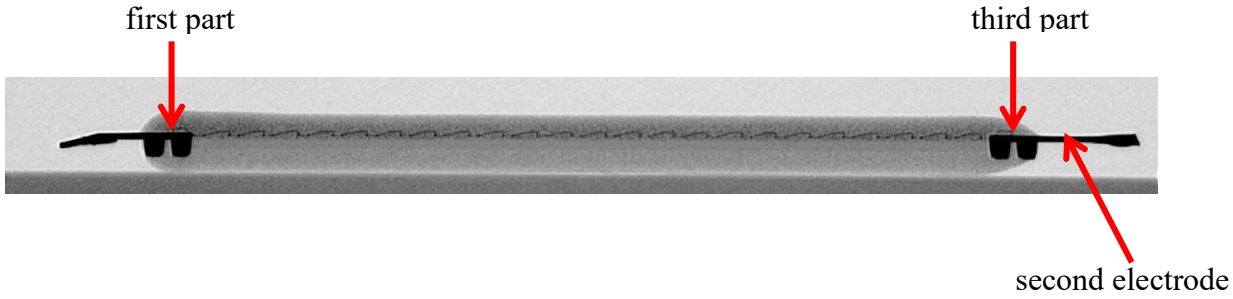
16. The light-emitting device of claim 1, wherein the carrier has a side surface devoid of the transparent body.	The GE A19 Medium Base LED Filament Bulb includes a carrier with a side surface devoice of the transparent body. As illustrated in the image below, a side surface of the carrier is not covered by the transparent body. 

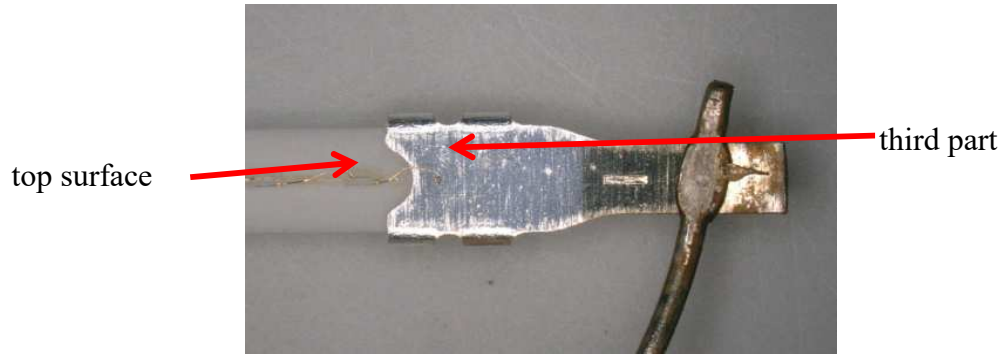
19. A light-emitting device, comprising:	The GE A19 Medium Base LED Filament Bulb includes a light-emitting device. For example, as shown in the image below, the GE A19 Medium Base LED Filament Bulb includes a light-emitting device.  

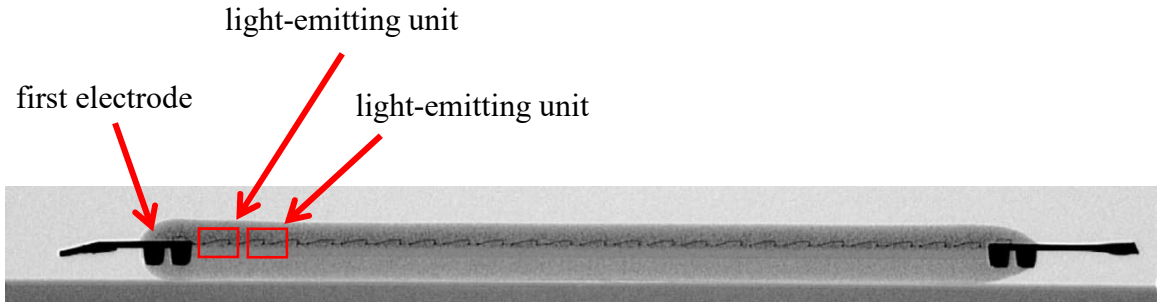
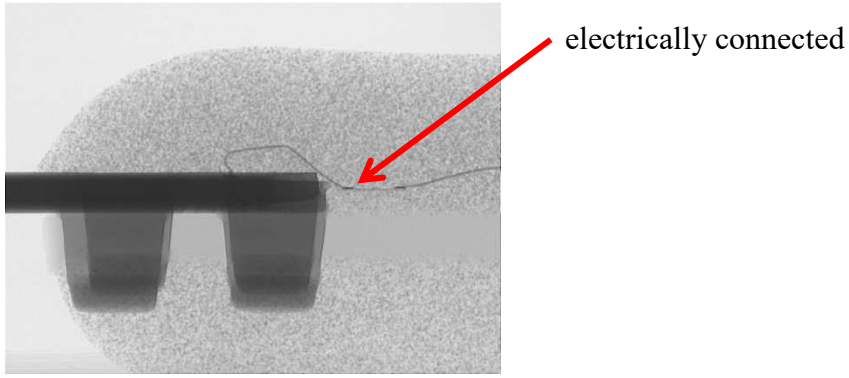
a carrier having a top surface and a bottom surface;	The GE A19 Medium Base LED Filament Bulb includes a carrier having a top surface and a bottom surface. For example, as shown in the microscopic images below, the GE A19 Medium Base LED Filament Bulb includes a plurality of filaments. Each filament has a transparent carrier having a top surface and a bottom surface. 

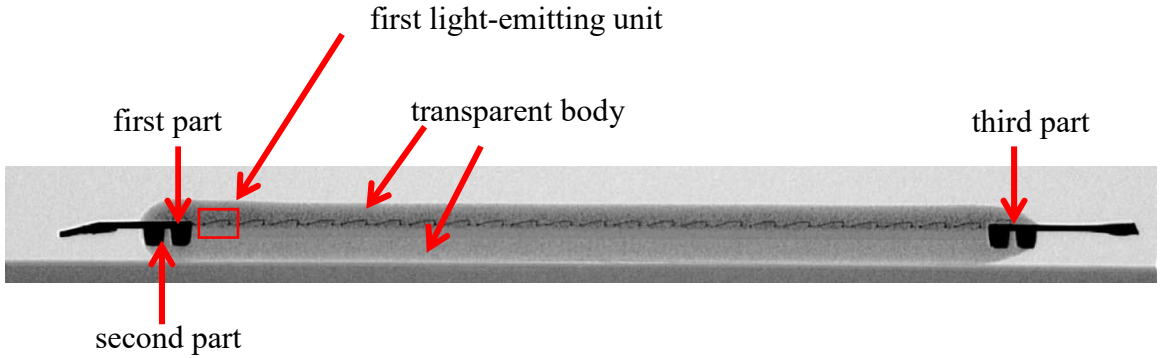
a first electrode having a first part formed on the top surface and a second part formed on the bottom surface;	The GE A19 Medium Base LED Filament Bulb includes a first electrode having a first part formed on the top surface and a second part formed on the bottom surface. As shown in the microscopic images below, each carrier of each filament includes a first electrode with a top part formed on the top surface of the carrier, and a bottom part formed on the bottom surface of the carrier.  As further shown in the images below, each first electrode includes a first part formed on the top surface of the carrier, and a bottom part formed on the bottom surface of the carrier.

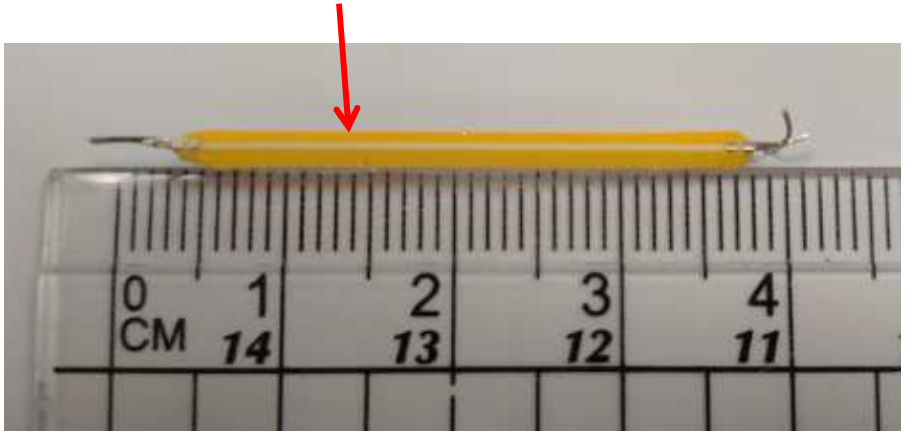

first part
top surface
second part
bottom surface

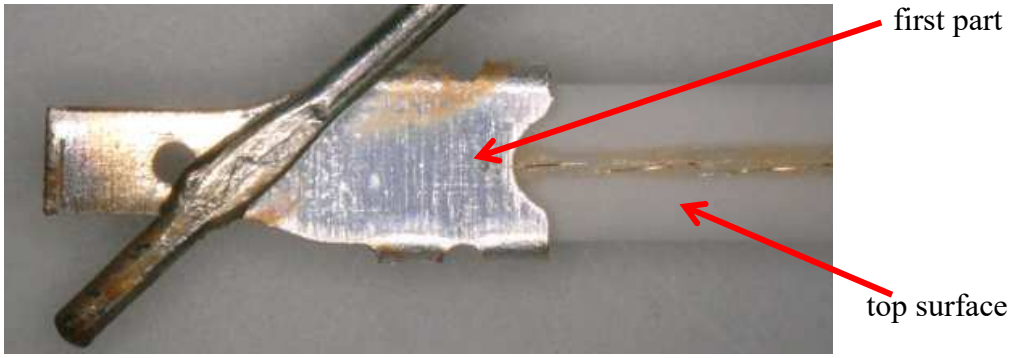
a second electrode having a third part formed on the top surface, wherein the first part and the third part are arranged at two opposite sides of the carrier;	The GE A19 Medium Base LED Filament Bulb includes a second electrode having a third part formed on the top surface, wherein the first part and the third part are arranged at two opposite sides of the carrier. As shown in the microscopic image below, each carrier of each filament includes a second electrode with a top part formed on the top surface of the carrier, the second electrode being positioned on the opposite side of the first electrode, the top part of the first electrode and the top part of the second electrode are arranged at two opposite sides of the carrier.  As further shown in the image below, each second electrode includes a third part formed on the top surface of the carrier.

	 top surface third part

a plurality of light-emitting units disposed on the top surface and electrically connected to the first electrode; and	The GE A19 Medium Base LED Filament Bulb includes a plurality of light-emitting units disposed on the top surface and electrically connected to the first electrode. As illustrated in the image below, a plurality of light-emitting units disposed on the top surface.  As shown in the close-up image below, the plurality of light-emitting units are electrically connected to the first electrode. 

a wavelength conversion layer covering the first part, the second part, the third part and the plurality of light-emitting units.	The GE A19 Medium Base LED Filament Bulb includes a wavelength conversion layer covering the first part, the second part, the third part and the plurality of light-emitting units. As shown in the images below, the first and second electrodes of each carrier, including the top parts and bottom parts of the first and second electrodes, and a plurality of LED chips are covered by a wavelength conversion layer. 

	wavelength conversion layer 

20. The light-emitting device of claim of 19, further comprising a connector electrically and physically connected to the first part and the second part.	The GE A19 Medium Base LED Filament Bulb includes a connector electrically and physically connected to the first part and the second part. As shown in the images below, the first part is electrically connected to the second part via a connector. 

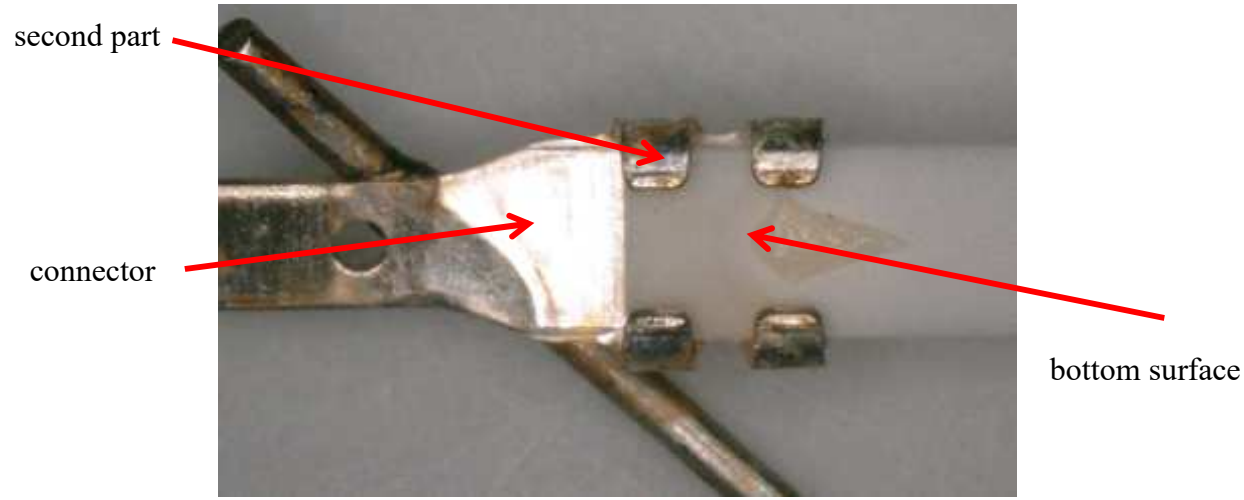
	 second part connector bottom surface

EXHIBIT 5

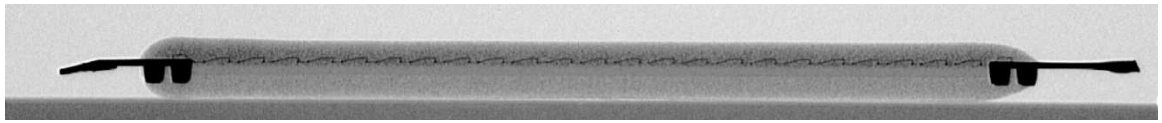
Exhibit 5: Infringement Claim Chart for U.S. Patent No. 10,224,455

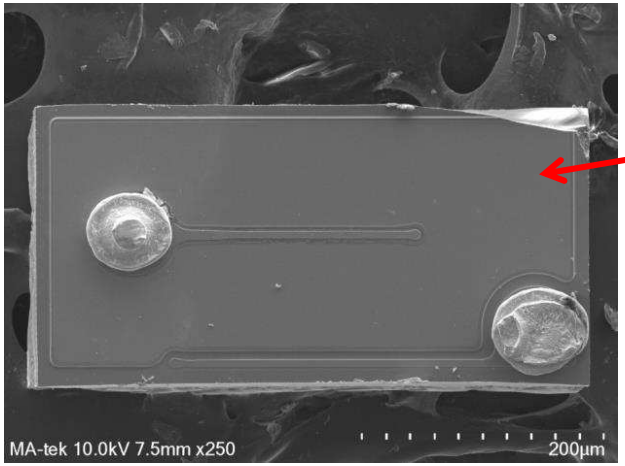
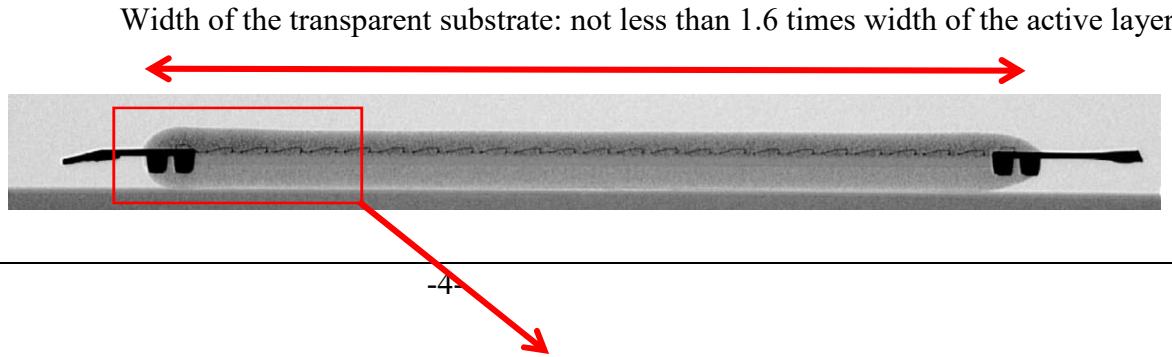
The Defendants infringe U.S. Patent No. 10,224,455 ("the '455 Patent") by making, using, selling, offering for sale, and importing at least certain GE Classic Series lightbulbs, GE Refresh Series lightbulbs, GE Relax Series lightbulbs, GE Basic Series lightbulbs, GE Reveal Series lightbulbs, and GE Vintage Series lightbulbs that include one or more LED filaments (the "Accused Product").

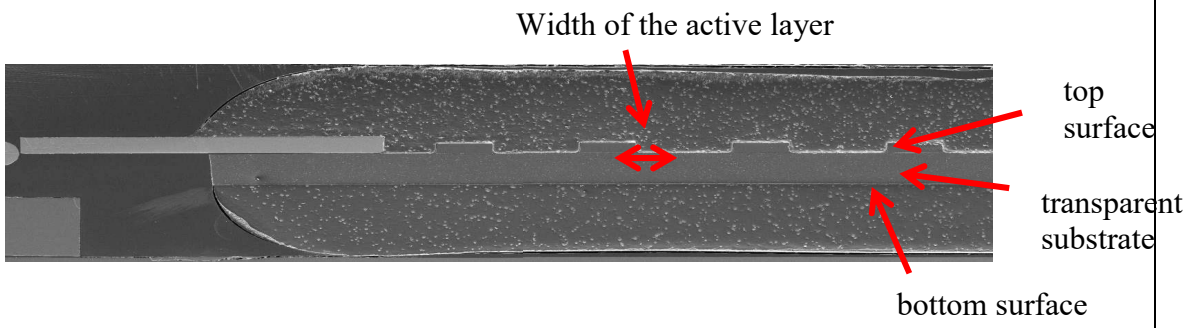
The asserted claims include elements that are implemented, at least in part, by proprietary hardware in the Accused Product. Plaintiff has provided these contentions based on analyzing the GE A19 Medium Base LED Filament Bulb as well as a review of the publicly available materials regarding the Accused Product. The chart is merely exemplary and may not show the functionality in its entirety. Furthermore, Plaintiff reserves the right to revise these contentions as discovery in the case progresses, in view of the Court's final claim construction in this action and in connection with expert reports.

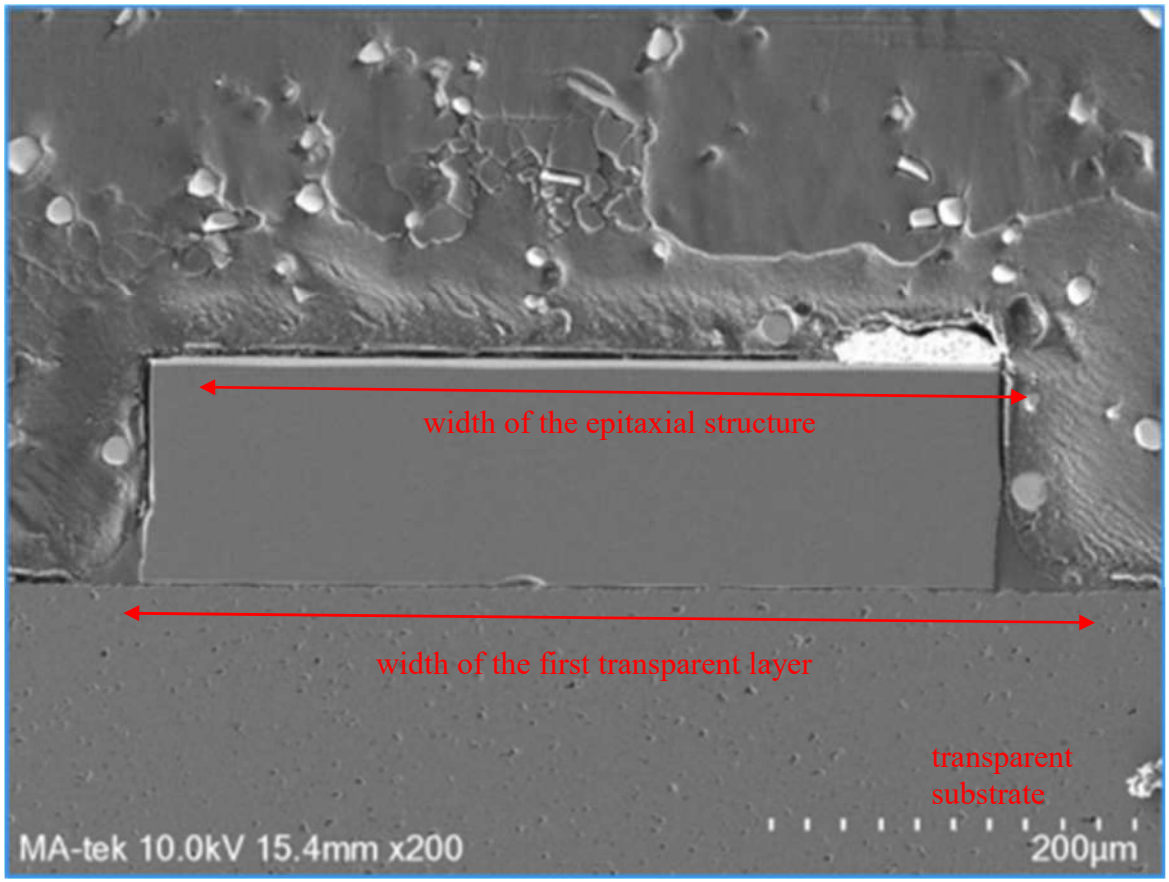
As one non-limiting example, at least the GE A19 Medium Base LED Filament Bulb includes the features cited in the chart below:

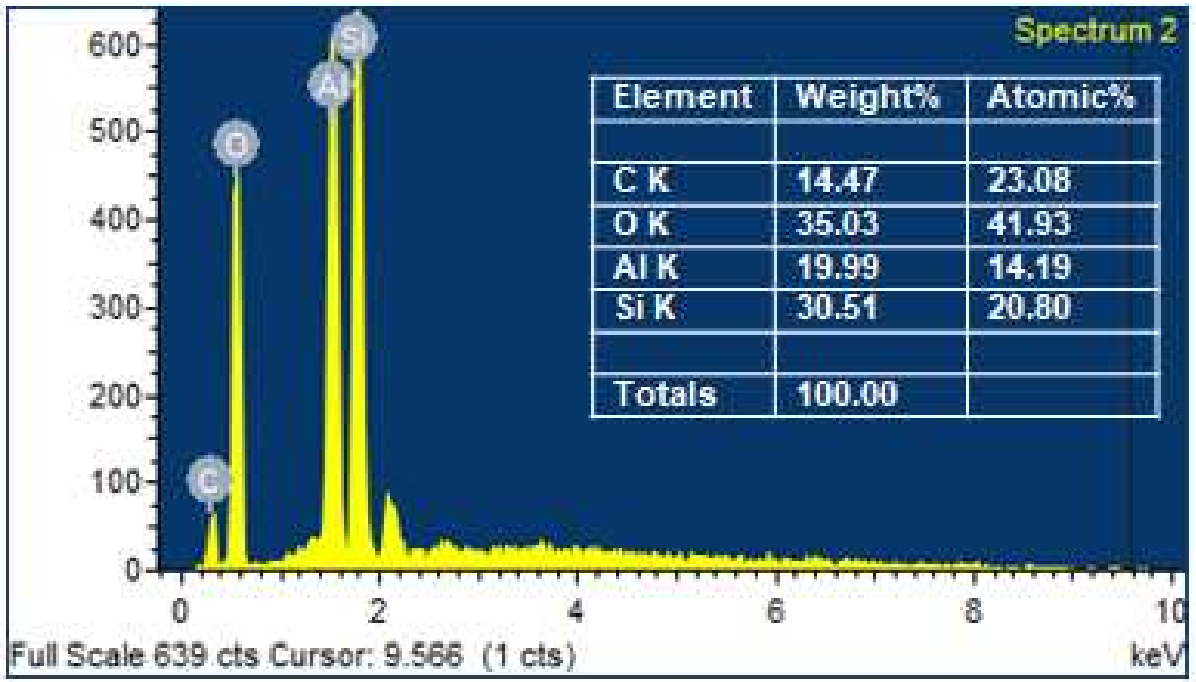
Claims	Exemplary Disclosures of Technical Features for GE A19 Medium Base LED Filament Bulb
1. A light-emitting device, comprising:	The GE A19 Medium Base LED Filament Bulb includes a light-emitting device. For example, as shown in the image below, the GE A19 Medium Base LED Filament Bulb includes a light-emitting device.  
an epitaxial structure comprising an active layer;	The GE A19 Medium Base LED Filament Bulb includes an epitaxial structure comprising an active layer. For example, as shown in the microscopic images below, the GE A19 Medium Base LED Filament Bulb includes a plurality of filaments.

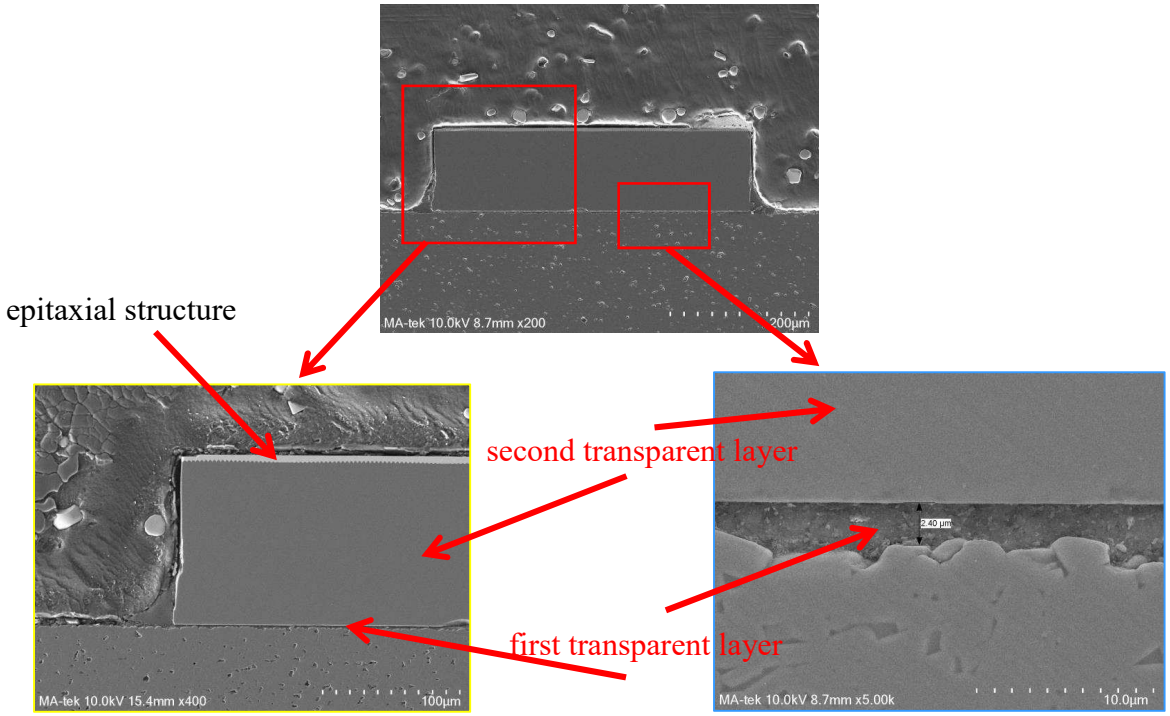
Claims	Exemplary Disclosures of Technical Features for GE A19 Medium Base LED Filament Bulb
	 Each filament has a plurality of epitaxial structures.  epitaxial structure Each epitaxial structure has an active layer.

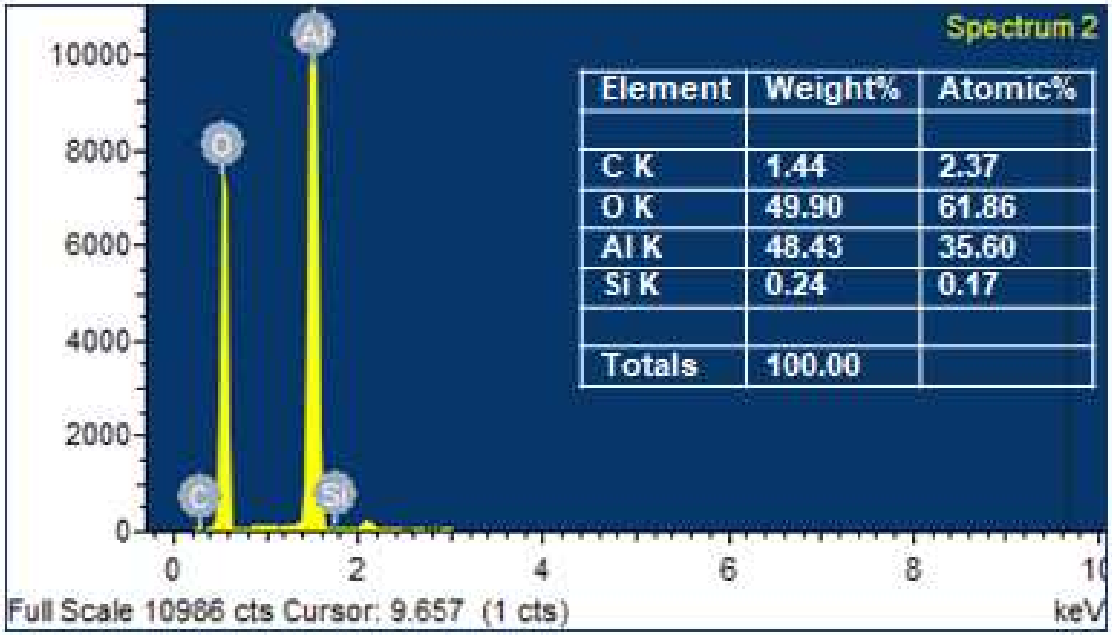
Claims	Exemplary Disclosures of Technical Features for GE A19 Medium Base LED Filament Bulb
	
a transparent substrate having a top surface being not less than 1.6 times an area of the active layer;	The GE A19 Medium Base LED Filament Bulb includes an epitaxial structure comprising an active layer and a transparent substrate having a top surface being not less than 1.6 times an area of the active layer. For example, as shown in the image below, the GE A19 Medium Base LED Filament Bulb includes a transparent substrate having a top surface being not less than 1.6 times an area of the active layer. 

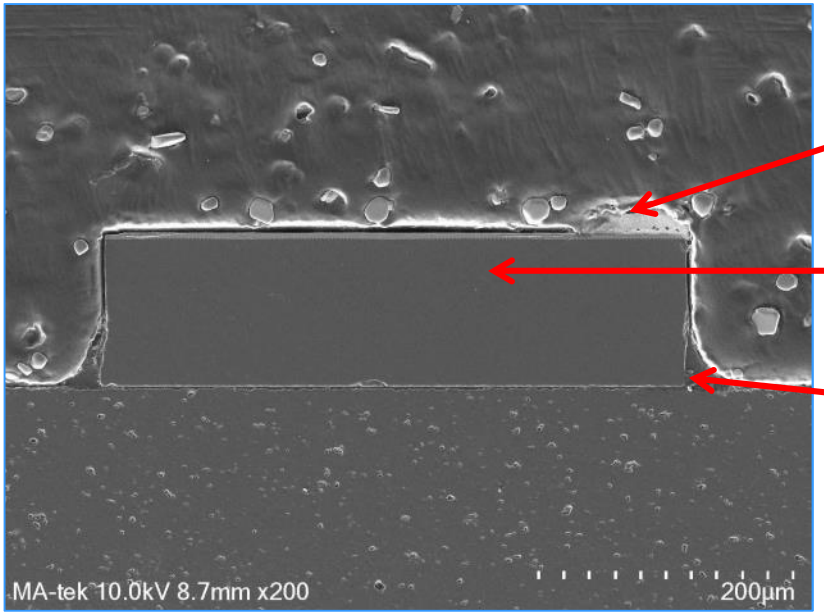
Claims	Exemplary Disclosures of Technical Features for GE A19 Medium Base LED Filament Bulb
	
a first transparent layer, directly connected to the transparent substrate and comprising a widest width smaller than that of the transparent substrate and larger than that of the epitaxial structure;	The GE A19 Medium Base LED Filament Bulb includes a first transparent layer, directly connected to the transparent substrate and comprising a widest width smaller than that of the transparent substrate and larger than that of the epitaxial structure. For example, as shown in the image below, the GE A19 Medium Base LED Filament Bulb includes a transparent adhesive layer directly connected to the transparent substrate, and comprising a widest width smaller than that of the transparent substrate, but larger than that of the epitaxial structure.

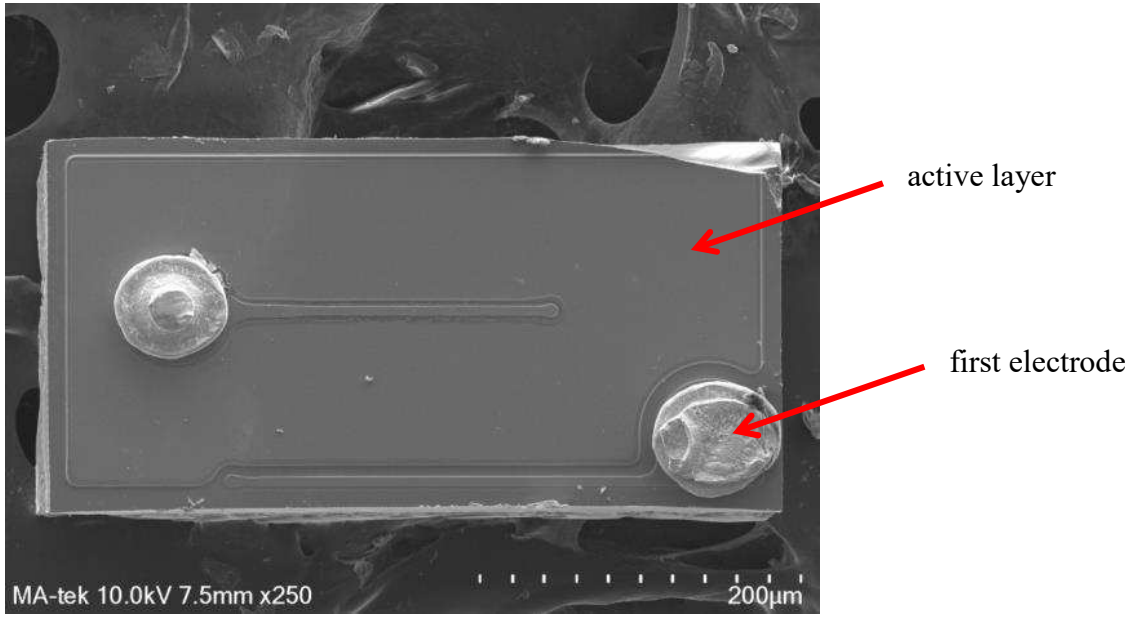
Claims	Exemplary Disclosures of Technical Features for GE A19 Medium Base LED Filament Bulb
	

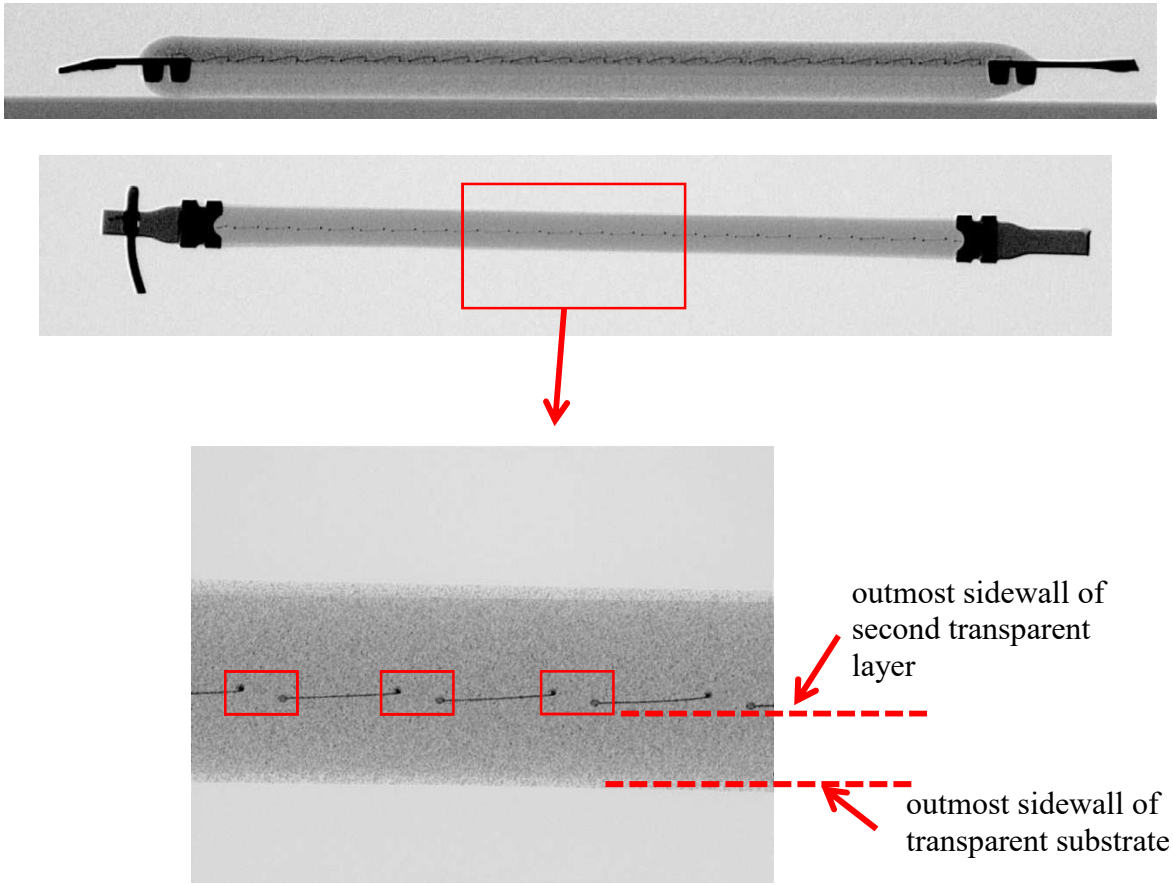
Claims	Exemplary Disclosures of Technical Features for GE A19 Medium Base LED Filament Bulb
	Based on a material analysis, the material for the first transparent layer is silicone-based. 
a second transparent layer, made of oxygen and only one metallic element, arranged between the first	The GE A19 Medium Base LED Filament Bulb includes a second transparent layer, made of oxygen and only one metallic element, arranged between the first transparent layer and the epitaxial structure.

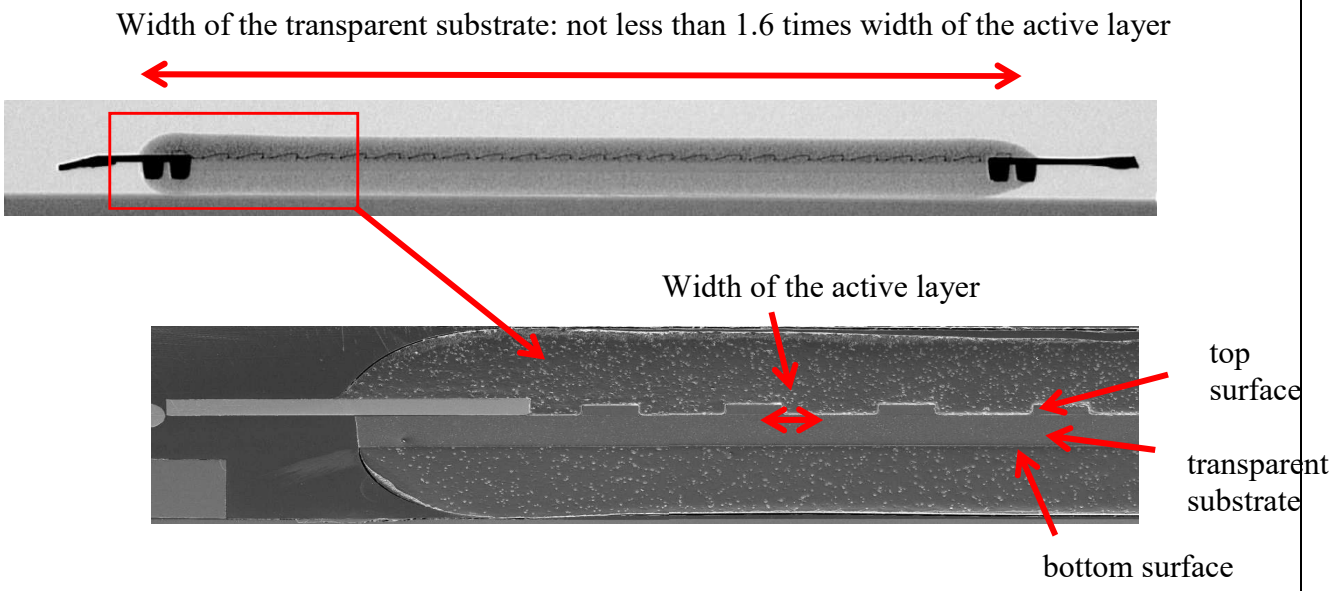
Claims	Exemplary Disclosures of Technical Features for GE A19 Medium Base LED Filament Bulb
transparent layer and the epitaxial structure; and	For example, as shown in the image below, the GE A19 Medium Base LED Filament Bulb includes a second transparent layer arranged between the first transparent layer and the epitaxial structure  The EDX analysis of the second transparent layer shows that it is made of oxygen and only one metallic element.

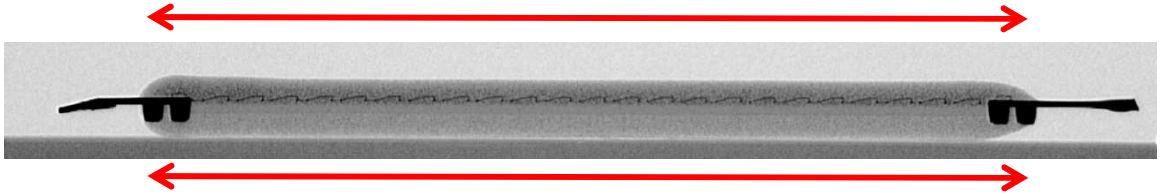
Claims	Exemplary Disclosures of Technical Features for GE A19 Medium Base LED Filament Bulb
	
a first electrode arranged on the first transparent layer and the second transparent layer which are not covered by the active layer,	The GE A19 Medium Base LED Filament Bulb includes a first electrode arranged on the first transparent layer and the second transparent layer which are not covered by the active layer. For example, as shown in the images below, the GE A19 Medium Base LED Filament Bulb includes a first electrode arranged on the first transparent layer and the second transparent layer which are not covered by the active layer.

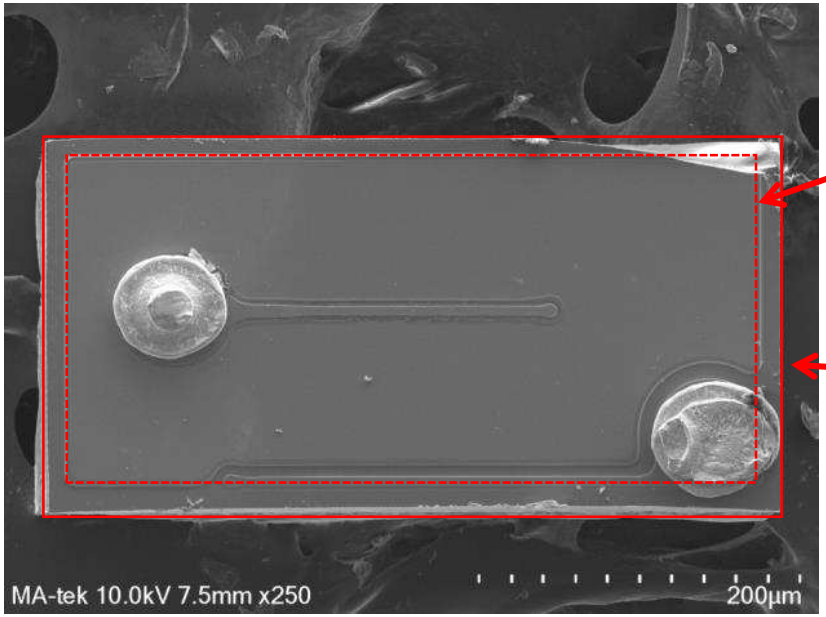
Claims	Exemplary Disclosures of Technical Features for GE A19 Medium Base LED Filament Bulb
	

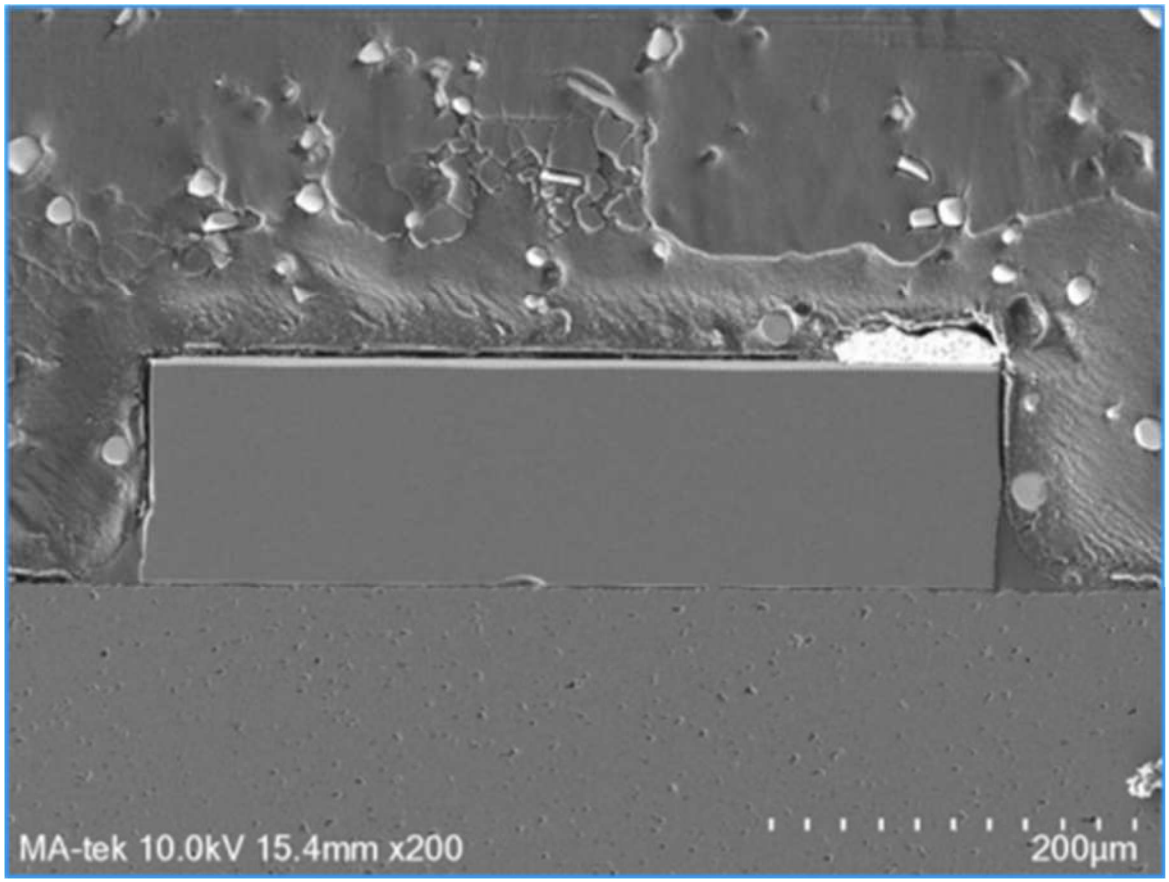
Claims	Exemplary Disclosures of Technical Features for GE A19 Medium Base LED Filament Bulb
	
wherein the second transparent layer and the transparent substrate have outmost sidewalls which are not coplanar with each other.	The GE A19 Medium Base LED Filament Bulb includes the second transparent layer and the transparent substrate have outmost sidewalls which are not coplanar with each other. For example, as shown in the images below, in the GE A19 Medium Base LED Filament Bulb, the second transparent layer and the transparent substrate have outmost sidewalls which are not coplanar with each other.

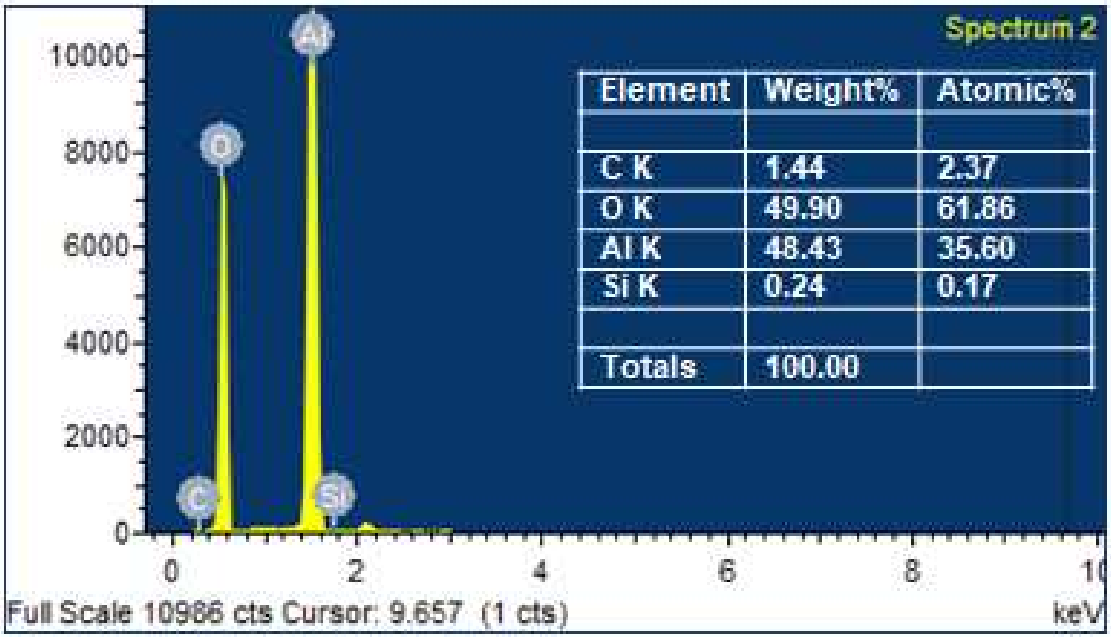
Claims	Exemplary Disclosures of Technical Features for GE A19 Medium Base LED Filament Bulb
	
3. The light-emitting device of claim 1, wherein	The GE A19 Medium Base LED Filament Bulb includes a transparent substrate wherein the transparent substrate has a bottom surface being not less than 1.6 times the area of the active layer.

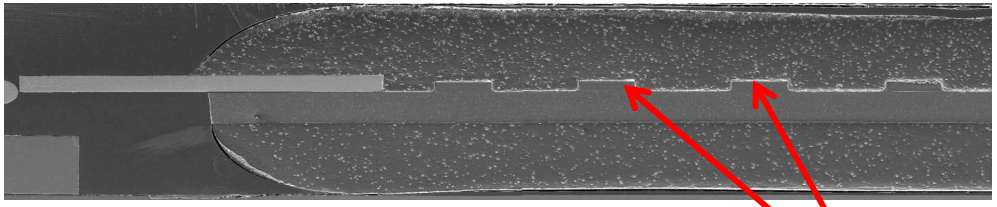
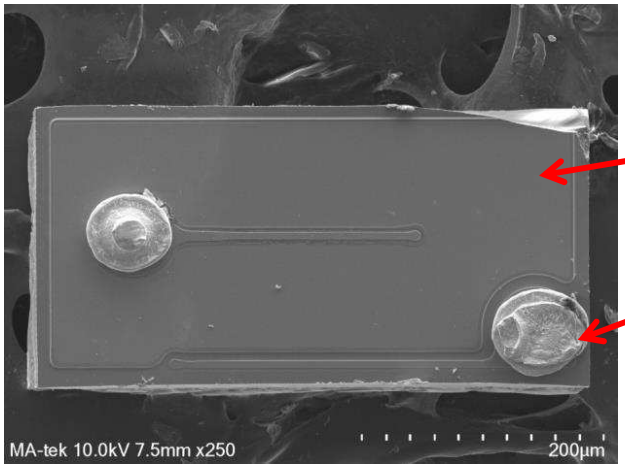
Claims	Exemplary Disclosures of Technical Features for GE A19 Medium Base LED Filament Bulb
the transparent substrate has a bottom surface being not less than 1.6 times the area of the active layer.	For example, as shown in the image below, the GE A19 Medium Base LED Filament Bulb includes a transparent substrate having a bottom surface being not less than 1.6 times an area of the active layer. 

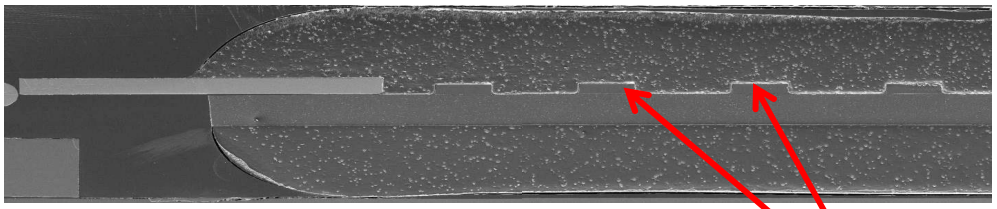
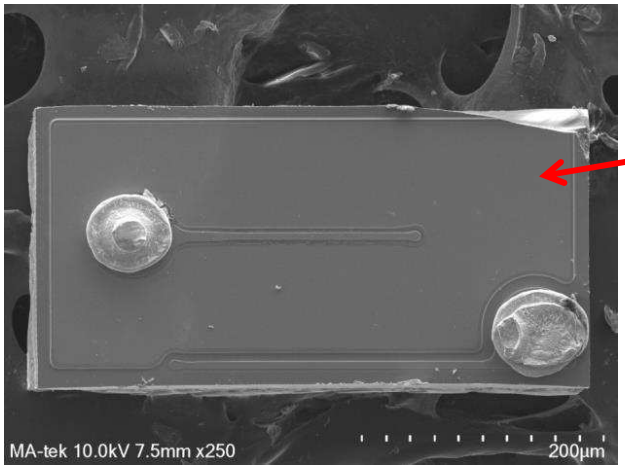
Claims	Exemplary Disclosures of Technical Features for GE A19 Medium Base LED Filament Bulb
5. The light-emitting device of claim 3, wherein the top surface and the bottom surface substantially have the same width.	The GE A19 Medium Base LED Filament Bulb includes a transparent substrate, wherein the top surface and the bottom surface of the transparent substrate substantially have the same width. For example, as shown in the image below, the GE A19 Medium Base LED Filament Bulb includes a transparent substrate having a top surface and a bottom surface being substantially have the same width. top surface width  bottom surface width
6. The light-emitting device of claim 1, wherein the active layer is narrower than the second transparent layer.	The GE A19 Medium Base LED Filament Bulb includes an active layer narrower than the second transparent layer. For example, as shown in the image below, the GE A19 Medium Base LED Filament Bulb includes an active layer that is narrower than the second transparent layer.

Claims	Exemplary Disclosures of Technical Features for GE A19 Medium Base LED Filament Bulb
	
9. The light-emitting device of claim 1, wherein the transparent substrate is made of a non-semiconductor material.	The GE A19 Medium Base LED Filament Bulb includes a transparent substrate, wherein the transparent substrate is made of a non-semiconductor material. The transparent as shown in the microscopic image below is not made of a semiconductor material.

Claims	Exemplary Disclosures of Technical Features for GE A19 Medium Base LED Filament Bulb
	
10. The light-emitting device of claim 1, wherein the second transparent	The GE A19 Medium Base LED Filament Bulb includes a second transparent layer comprising a metal oxide.

Claims	Exemplary Disclosures of Technical Features for GE A19 Medium Base LED Filament Bulb
layer comprises a metal oxide.	The EDX analysis of the second transparent layer shows that it is made of a metal oxide. 
12. The light-emitting device of claim 1, wherein the first electrode is separated from the active layer.	The GE A19 Medium Base LED Filament Bulb includes a first electrode wherein the first electrode is separated from the active layer. For example, as shown in the images below, the GE A19 Medium Base LED Filament Bulb includes a filament with a plurality of epitaxial structures, where each epitaxial has an active layer and a first electrode separated from each other.

Claims	Exemplary Disclosures of Technical Features for GE A19 Medium Base LED Filament Bulb
	 epitaxial structure  active layer first electrode
13. The light-emitting device of claim 1, further comprising a second	The GE A19 Medium Base LED Filament Bulb includes a second electrode arranged on the epitaxial structure. For example, as shown in the images below, the GE A19 Medium Base LED Filament Bulb includes a filament with a plurality of epitaxial structures, where each epitaxial has an active layer.

Claims	Exemplary Disclosures of Technical Features for GE A19 Medium Base LED Filament Bulb
electrode arranged on the epitaxial structure.	 epitaxial structure  active layer Each epitaxial structure has a second electrode arranged on top.

Claims	Exemplary Disclosures of Technical Features for GE A19 Medium Base LED Filament Bulb
	second electrode